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July 9, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 9, 1985 Volume 1056 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
May 7, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 6, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,337,539 through 4,338,684

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,112,122, Re. S.N. 717,483, Filed Mar. 29, 1985, Cl. 435/321, PRESERVATION PROCESS, Denis J. G. Long, Owner of Record: *BP Chemicals Ltd., London, England,* Attorney or Agent: Harold Haidt, et al., Ex. Gp.: 128

4,308,400, Re. S.N. 719,033, Filed Apr. 3, 1985, Cl. 568/336, SENSITIZERS FOR PHOTOPOLYMERIZATION, Louis Felder, et al., Owner of Record: *Ciba-Geigy Corp., Ardsley, N.Y.,* Attorney or Agent: John T. Miller, et al., Ex. Gp.: 126

4,349,463, Re. S.N. 737,034, Filed May 22, 1985, Cl. 252/457, ACETYLENE STORAGE VESSEL, Edith M. Flanigan, Owner of Record: *N. I. Industries, Inc., Long Beach, Calif.,* Attorney or Agent: W. Poms, et al., Ex. Gp.: 157

4,385,461, Re. S.N. 738,641, Filed May 28, 1985, Cl. 040/352, SEQUENTIALLY HIGHLIGHTING COPY HOLDER, Hale Wingfield, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 333

4,385,935, Re. S.N. 739,181, Filed May 30, 1985, Cl. 106/098, METHOD OF PRODUCING LIGHT WEIGHT CEMENT FOR USE OF CEMENTATION OF OIL AND GAS WELLS, Sigve Skjeldal, Owner of Record: *Elkem A/S, Oslo, Norway,* Attorney or Agent: William D. Lucas, et al., Ex. Gp.: 113

4,430,968, Re. S.N. 738,376, Filed May 28, 1985, Cl. 123/90.270, CYLINDER HEAD FASTENING STRUCTURE FOR INTERNAL COMBUSTION ENGINES, Yorio Futakuchi, et al., Owner of Record: *Yamaha Hatsudoki Kabushiki Kaisha D.B.A. Yamaha Motor Co., Shizuoka-Ken, Japan,* Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 346

4,431,658, Re. S.N. 738,702, Filed May 29, 1985, Cl. 514/210, AZA PENEM COMPOUNDS, Adriano Afonso, et al., Owner of Record: *Schering Corp., Kenilworth, N.J.,* Attorney or Agent: Gerald S. Rosen, et al., Ex. Gp.: 125

4,461,810, Re. S.N. 737,501, Filed May 24, 1985, Cl. 428/530, TiO_2 BEARING A COATING WITH CERIUM CATIONS AND SULFATE-, PHOSPHATE-, OR SILICATE ANIONS, Howard Wayne Jacobson, Owner of Record: *E. I. du Pont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: Fred F. Butzi, Ex. Gp.: 154

4,473,658, Re. S.N. 737,641, Filed May 24, 1985, Cl. 502/046, MOVING BED CATALYTIC CRACKING PROCESS WITH PLATINUM GROUP METAL OR RHENIUM SUPPORTED DIRECTLY ON THE CRACKING CATALYST, Albert B. Schwartz, Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Alexander J. McKillop, et al., Ex. Gp.: 116

4,481,986, Re. S.N. 736,662, Filed May 22, 1985, Cl. 141/004, METHOD AND APPARATUS FOR MAKING CARBONATED BEVERAGES, Louis B. Meyers, Owner of Record: *Inventor,* Attorney or Agent: Jerome Bauer, et al., Ex. Gp.: 243

4,490,121, Re. S.N. 737,404, Filed May 24, 1985, Cl. 441/005, MOORING SYSTEM, Anton Coppens, et al., Owner of Record: *Single Buoy, Inc., Fribourg, Switzerland,* Attorney or Agent: Robert J. Patch, Ex. Gp.: 315

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,515,792, Reexam. No. 90/000,761, Requested: Apr. 18, 1985, Cl. 84/1.03, DIGITAL ORGAN, Ralph Deutsch, Owner of Record: *Allen Organ Co., Macungie, Pa.,* Attorney or Agent: Sanford J. Piltch, Ex. Gp.: 210, Requester: Thomas L. Adams, Morristown, N.J.

3,792,272, Reexam. No. 90/000,791, Requested: May 31, 1985, Cl. 250/243, BREATH TEST DEVICE FOR ORGANIC COMPONENTS INCLUDING ALCOHOL, Richard A. Harte, et al., Owner of Record: *CMI, Inc., Minturn, Colo.,* Attorney or Agent: George H. Gerstman, Ex. Gp.: 250, Requester: Verax Systems, Inc., Fairport, N.Y.

4,014,207, Reexam. No. 90/000,793, Requested: June 5, 1985, Cl. 73/64.4, SECTOR SCANNING ULTRASONIC INSPECTION APPARATUS, Edward P. Meyer, et al., Owner of Record: *Picker International, Inc., Highland Heights, Ohio,* Attorney or Agent: Watts, Hoffmann, et al., Ex. Gp.: 260, Requester: Siemens Medical Systems, Inc., Iselin, N.J.

4,232,614, Reexam. No. 90/000,796, Requested: June 11, 1985, Cl. 110/235, PROCESS OF INCINERATION WITH PRE-DRYING OF MOIST FEED USING HOT INERT PARTICULATES, Elliot B. Fitch, et al., Owner of Record: *Dorr-Oliver, Inc., Stamford, Conn.,* Attorney or Agent: Harold M. Snyder, Ex. Gp.: 344, Requester: Standard Oil Co., Cleveland, Ohio

4,273,861, Reexam. No. 90/000,795, Requested: June 11, 1985, Cl. 430/382, MULTILAYER COLOR PHOTOGRAPHIC MATERIALS UTILIZING AN INTERPLAYER CORRECTION COUPLER, Keisuke Shiba, et al., Owner of Record: *Fuji Photo Film Co., Ltd., Minami-Ashigara,* Attorney or Agent: Sughrue, Mion, et al., Ex. Gp.: 150, Requester: Owner

4,341,441, Reexam. No. 90/000,789, Requested: May 28, 1985, Cl. 350/96.30, METHOD OF MAKING SOLID PREFORMS AND OPTICAL FIBER DRAWN THEREFROM, Paul E. Lighty, et al., Owner of Record: *International Standard Electric Corp., New York, N.Y.,* Attorney or Agent: John T. O'Halloran, Ex. Gp.: 250, Requester: AT&T Bell Laboratories, Murray Hill, N.J.

4,407,290, Reexam. No. 90/000,794, Requested: June 10, 1985, Cl. 128/633, BLOOD CONSTITUENT MEASURING DEVICE AND METHOD, Scott A. Wilber, Owner of Record: *By Mesne Assigts. To Bioximetry Technology, Inc., Boulder, Colo.,* Attorney or Agent: Larry R. Cassett, Requester: Owner

4,452,053, Reexam. No. 90/000,792, Requested: June 3, 1985, Cl. 66/123, STAMPED KNITTING-TOOL FOR KNITTING MACHINES, Gerhard Egbers, et al., Owner of Record: *Sulzer Morat GmbH, Filderstadt, W. Germany,* Attorney or Agent: Jack F. Kramer, Ex. Gp.: 247, Requester: Owner

Errors in Notice of Allowance

The purpose of this notice is to clarify existing Office practice with respect to providing a new issue fee due date. Sometimes errors appear on the Notice of Allowance, such as an incorrect number of claims, the misspelling of an inventor's name, an incorrect inventorship, or an incorrect title. A duplicate Notice of Allowance correcting the errors may be requested from the Group that mailed the Notice. However, a new issue fee due date will not be provided if the information on the original Notice of Allowance is sufficient to allow a reasonable practitioner to timely file a proper issue fee in the correct application. Specifically, the mere filing of a request for a corrected or duplicate Notice of Allowance will not act to stay the period for paying the issue fee.

JAMES E. DENNY,
Deputy Assistant Commissioner for Patents.

June 12, 1985.

PATENT NOTICES

Certificates of Correction for the Week of July 9, 1985

B1 3,434,165	4,460,607	4,485,820	4,499,806
PP. 5,383	4,462,399	4,485,977	4,500,055
PP. 5,416	4,466,798	4,486,207	4,501,350
D. 276,538	4,467,348	4,486,639	4,501,887
D. 276,710	4,468,110	4,487,630	4,502,383
4,146,768	4,468,373	4,487,719	4,502,588
4,298,353	4,468,844	4,487,787	4,502,823
4,302,457	4,469,902	4,488,140	4,503,127
4,318,169	4,472,730	4,488,870	4,503,554
4,366,304	4,472,795	4,489,496	4,503,572
4,382,796	4,473,507	4,489,563	4,504,356
4,390,628	4,474,775	4,491,104	4,504,450
4,396,301	4,475,031	4,491,505	4,504,493
4,400,579	4,475,170	4,493,095	4,504,601
4,400,915	4,475,242	4,493,638	4,504,671
4,408,200	4,475,397	4,493,692	4,504,702
4,416,526	4,475,429	4,493,799	4,504,797
4,419,438	4,476,480	4,494,024	4,504,860
4,420,028	4,476,575	4,494,191	4,505,965
4,427,701	4,477,035	4,494,614	4,506,156
4,430,346	4,477,061	4,494,899	4,506,263
4,433,964	4,477,388	4,495,036	4,506,647
4,436,344	4,477,391	4,495,105	4,506,709
4,440,717	4,477,507	4,495,117	4,506,739
4,441,088	4,477,508	4,495,190	4,506,760
4,441,759	4,477,652	4,495,593	4,507,435
4,442,525	4,478,103	4,495,624	4,507,619
4,443,264	4,478,261	4,496,683	4,507,652
4,450,017	4,478,300	4,496,803	4,507,715
4,450,401	4,478,534	4,497,135	4,507,716
4,452,854	4,478,604	4,497,678	4,508,810
4,455,094	4,478,833	4,497,834	4,508,837
4,455,618	4,478,911	4,497,863	4,508,852
4,455,743	4,480,703	4,497,949	4,509,110
4,456,671	4,482,478	4,498,087	4,509,702
4,458,035	4,482,961	4,498,299	4,509,845
4,458,377	4,484,289	4,498,567	4,510,309
4,459,076	4,484,566	4,498,988	4,510,370
4,460,008	4,485,458	4,499,064	4,510,411
4,460,110	4,485,747	4,499,319	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 8, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-28-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	7-08-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-22-83

Expiration of patents: The patents within the range of numbers indicated below expire during June 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,386,103 to 3,390,404, inclusive
Plant Patents ..... Numbers 2,814 to 2,816 inclusive

REEXAMINATIONS

JULY 9, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,706,344 (362nd)
TUBING CONVEYED PERMANENT COMPLETION METHOD AND DEVICE
Roy R. Vann, 3302 Providence Dr., Midland, Tex. 79701
Reexamination Request No. 90/000,471, Nov. 25, 1983.
Reexamination Certificate for Patent No. 3,706,344, issued Dec. 19, 1972, Ser. No. 80,991, Oct. 15, 1970.
Int. Cl.[3] E21B *43/116, 43/12, 43/14*
U.S. Cl. 166—297

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** and **11–24** is confirmed.

Claims **25** and **26** are cancelled.

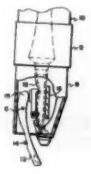
Claim **7** is determined to be patentable as amended.

Claims **8–10**, dependent on an amended claim, are determined to be patentable.

7. In a well having a borehole which extends downhole through an upper and lower hydrocarbon containing zone, with each zone having at least one hydrocarbon containing formation, with the lower zone being isolated from the interior of the borehole by a well casing or the like, the method of completing the lower zone of the well after the upper zone has been completed comprising the steps of:

1. suspending a casing perforator means and a packer means from a tubing string;
2. setting the packer means downhole in the borehole at a location which positions the perforator means adjacent to at least one hydrocarbon containing formation of the lower hydrocarbon containing zone, while at the same time isolating the portion of the borehole underlying the packer means from the portion of the borehole located above the packer means;
3. forming an unobstructed flow path which extends from the borehole annulus underlying the packer means, into the tubing string, and uphole to the top of the borehole;
4. actuating the casing perforator means *while maintaining the unobstructed flow path* so as to perforate the casing and to communicate the hydrocarbon containing formation of the lower zone with the borehole annulus underlying the packer means to thereby enable production from the last named formation to flow through the perforations, into the lower borehole annulus underlying the packer means, into and up through the tubing string, and to the top of the borehole.

B1 3,741,439 (363rd)
VISCOUS LIQUID DISPENSER
Roger K. Vehrs, Fresno, Calif., assignor to Ben D. Tobor, Houston, Tex.
Reexamination Request No. 90/000,578, Jun. 21, 1984.
Reexamination Certificate for Patent No. 3,741,439, issued Jun. 26, 1973, Ser. No. 195,557, Nov. 4, 1971.
Int. Cl.[3] B65D *35/28*
U.S. Cl. 222—103



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

Claim **10** is cancelled.

New claim **11** is added and determined to be patentable.

1. In a viscous liquid dispensing device the combination comprising,

a length of elastic tubing having a high modulus of resilience;

a reservoir adapted to contain a viscous liquid and connected to the upstream end of said length of elastic tubing;

wall means spanning at least a portion of the length of said elastic tubing and positioned adjacent thereto;

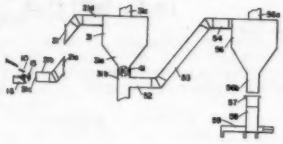
wedge means moveable with respect to said elastic tubing and positioned adjacent thereto and on the opposite side of said tubing from said wall means so that said wedge means may be moved to wedge a portion of said elastic tubing against said wall means, the upstream portion of said wedge means pressing said elastic tubing against said wall means before the downstream portion of said wedge means to force said viscous liquid in the downstream direction to be expelled from the orifice at the downstream end of said length of elastic tubing;

and closure means positioned adjacent said elastic tubing and above the orifice at the downstream end thereof to prevent said viscous liquid from leaking from said orifice at said downstream end of said elastic tubing when said device is not in use and to prevent air from entering said orifice after the expelling stroke of said wedge means when said elastic tubing is returning to its natural shape and drawing additional viscous liquid, said closure means being overridden by the movement of said viscous liquid during the expelling stroke of said wedge means to permit the discharge of viscous liquid from said orifice.

B1 3,883,334 (364th)
MINERAL FIBER PRODUCTION METHOD AND APPARATUS

Don Cassidy, Martinsville, and Ray W. Barkhau, Indianapolis, both of Ind., assignors to L. C. Cassidy & Son, Inc., Indianapolis, Ind.

Reexamination Request No. 90/000,666, Nov. 9, 1984.
Reexamination Certificate for Patent No. 3,883,334, issued May 13, 1975, Ser. No. 472,817, May 23, 1974.
Int. Cl.[3] **C03B** *37/06*
U.S. Cl. 65—2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A method of producing a homogeneous mineral fiber product from a stream of molten slag comprising: rectilinearly projecting and fiberizing the slag by entraining it in an annularly arranged array of steam jets; providing a collecting tube concentric with the annular array of steam jets for receiving the fiberized material with the open receiving end of the tube spaced from the point of entry of the slag into the steam flow and having a diameter somewhat less than the of the remainder of the tube to provide a conical entry section; connecting the end of said collecting tube remote from the entry section to an initial cyclone-type centrifugal separator; dropping the discharge from the lower end of the cyclone separator through an unloading valve; drawing off the fiberized material of lesser mass through a horizontal tube communicating with the discharge from the unloading valve; providing a conveying tube communicating with the horizontal tube and with the intake of a second cyclone-type centrifugal separator; providing air moving fans for establishing suction in said collecting tube, horizontal tube, conveying tube and said centrifugal separators; and providing a means for accumulating the homogeneous product issuing from the lower end of the second centrifugal separator.

B1 4,166,465 (365th)
ELECTROSURGICAL DISPERSIVE ELECTRODE

Janet M. Esty, Boulder, and John A. Cox, Broomfield, both of Colo., assignors to Neomed Incorporated, Boulder, Colo.

Reexamination Request No. 90/000,531, Mar. 19, 1984.
Reexamination Certificate for Patent No. 4,166,465, issued Sep. 4, 1975, Ser. No. 842,463, Oct. 17, 1977.
Int. Cl.[3] **A61B** *17/39*; **A61N** *3/06*
U.S. Cl. 128—303.13

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **4**, and **12** are determined to be patentable as amended.

Claims **2**, **3**, **5–11** and **13–22**, dependent on an amended claim, are determined to be patentable.

1. A dispersive electrode adapted for use with electrosurgical equipment in establishing a capacitive coupling with the skin of a **[**mammal**]** *patient* comprising:

[an**]** *a flexible* insulated backing member;

a substrate in the form of a flexible electrically conductive layer having one surface applied to one surface of said backing member and a second surface adapted to be applied to the skin;

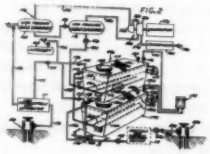
means for applying said second surface to the skin so as to define a direct capacitive interface between said second surface and the skin capable of safely dispersing current flow when used with electrosurgical equipment, said means for applying including a *flexible* dielectric film applied directly to said second surface of said substrate and which when applied to the skin defines said capactive interface between said second surface of said substrate and the skin, *and securing means for flexibly applying said dielectric film to the skin whereby to conform to different contours of the patient's body for the uniform dispersal of current flow therethrough*; and

electrical connecting means for making electrical contact with said substrate.

B1 4,428,200 (366th)
GEOTHERMAL PLANT FLUID REINJECTION SYSTEM

Barkman C. McCabe, Los Angeles; Edward Zajac, Hollywood, and John L. Featherstone, El Centro, all of Calif., assignors to Magma Power Company, Los Angeles, Calif.

Reexamination Request No. 90/000,573, Jun. 6, 1984.
Reexamination Certificate for Patent No. 4,428,200, issued Jan. 31, 1984, Ser. No. 177,633, Aug. 13, 1980.
Int. Cl.[3] **F03G** *7/04*
U.S. Cl. 60—641.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–19**, **23–48** and **52–57** are cancelled.

Claims **20**, **49**, **58**, and **59** are determined to be patentable as amended.

Claims **21**, **22**, **50**, and **51**, dependent on an amended claim, are determined to be patentable.

20. The method of **[**claim **5**, wherein said zone of particulate material is established in "Baker" settling tank means**]** *extending the operational life of a reinjection well in a geothermal energy system which has a geothermal brine flow path comprising a production well providing a stream of high temperature, high*

dissolved silica content geothermal brine, heat extraction means and a reinjection well, which comprises:

establishing a zone of particulate material in said flow path between said heat extraction means and said reinjection well, said zone of particulate material comprising a floating sludge blanket comprising primarily silica in said geothermal brine stream, and said zone of particulate material being established in "Baker" settling tank means,

passing said geothermal brine stream through said zone in contact with said particulate material to seed the precipitation of dissolved silica from said brine onto said particles so as to reduce the amount of dissolved silica available for precipitation in said reinjection well, and

minimizing the occurrence of other chemical reactions in said zone which would be injurious to said reinjection well by excluding atmospheric oxygen from said zone.

REISSUES

JULY 9, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

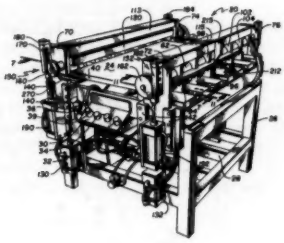
Re. 31,938
WEB BENDING FIXTURE

Roger Klukow, Champlin, Minn., assignor to Chesley F. Carlson Company, Minneapolis, Minn.

Original No. 4,365,500, dated Dec. 28, 1982, Ser. No. 230,281, Jan. 30, 1981. Application for reissue Nov. 23, 1983, Ser. No. 554,537

Int. Cl.³ B21D *5/01*

U.S. Cl. 72—387 **29 Claims**



28. A web bending fixture for bending plates of metal having a leading edge and trailing edge comprising:

a bed to support the plate to be bent;

at least one anvil having a bending radius at the edge of the bed;

at least one eccentric camming member having a bending surface positioned relative to the anvil to bend one of the edges of the plate around the bending radius of the anvil;

a full bearing supporting each end of the eccentric camming member for rotation:

at least one additional bearing intermediate the ends of the eccentric camming member within which the eccentric camming member is rotatably contained during rotation, supporting radially the eccentric camming member intermediate its length; and

means for rotating the eccentric camming member around the bending radius of the anvil, the closest point on the bending surface of the eccentric camming member being spaced from the anvil at all times during rotation a distance equivalent to the thickness of the plate being bent.

Re. 31,939
ANIMAL FEEDER

Larry R. Van Dusseldorp, Britt, Iowa, assignor to Marting Mfg. Inc., Washington Court House, Ohio

Original No. 4,278,049, dated Jul. 14, 1981, Ser. No. 148,787, May 12, 1980. Application for reissue Jul. 11, 1983, Ser. No. 512,714

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—53.5 **19 Claims**

13. An animal feeder comprising,

a feed hopper having side walls, end walls, a bottom assembly, and an open top,

a movable closure operable to close said open top of said feed hopper,

metering means positioned to extend below the lower edge of at least one of said side walls,

said bottom assembly including a feed trough under said metering means and in communication with said feed hopper,

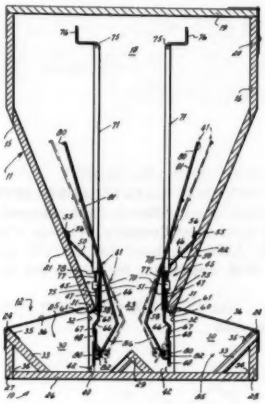
said metering means including a slide plate housing, a slide plate, and an agitator plate,

said slide plate housing being mounted on the inside surface of said at least one side wall,

said slide plate being supported by said housing for vertical movement relative thereto,

said agitator plate being movably suspended from said slide plate,

adjustment means for effecting vertical adjustment of said slide plate relative to said housing, said adjustment means including a rod secured adjacent one end to said slide plate and



having the opposite end accessible through the open top of said feed hopper such that movement of said opposite end of said rod effects vertical adjustment of said slide plate and of the depending agitator plate, and

said agitator plate being suspended from said slide plate by at least one strip of flexible belting so as to permit relatively unlimited inward swinging movement of said agitator plate relative to said slide plate.

Re. 31,940
IDENTIFICATION TAG FOR LIVESTOCK

Eugene B. Ritchey, Rte. 2, Box 58, Brighton, Colo. 80601

Original No. 4,359,015, dated Nov. 16, 1982, Ser. No. 232,127, Feb. 6, 1981. Application for reissue Oct. 27, 1983, Ser. No. 545,841

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—156 **17 Claims**

1. An identification tag for animals [that is installed] *for installation* in an opening cut through the skin tissue of the animal wherein the tag enhances healing of the opening and will shed obstructions, said tag comprising:

a first conical portion , *having a cross-sectional angle not*

exceeding 90°, to be positioned on one side of the opening with the smaller end toward the opening;

a second conical portion , *having a cross-sectional angle not exceeding 90°*, to be positioned on the opposite side of the opening with the smaller end toward the opening; and

means positionable through the opening to connect said smaller ends of said conical portions together within the opening, the surface of said conical portions extending away from the opening [at an angle to the skin tissue] so that said surface does not normally contact the skin tissue and will shed away obstacles coming into contact with said surface *by pivoting in the opening so that the surface engaged by the obstacle is at an obtuse angle to the skin.*

Re. 31,941

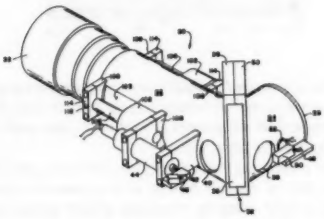
MULTIPLEX INTERFEROMETER

Gerald L. Auth, Laguna Beach, Calif., assignor to The Gerber Scientific Instrument Company, Windsor, Conn.

Original No. 3,936,193, dated Feb. 3, 1976, Ser. No. 442,254, Feb. 13, 1974. Application for reissue Jul. 5, 1977, Ser. No. 812,590

Int. Cl.³ G01B *9/02;* **G02B** *7/02*

U.S. Cl. 356—346 **25 Claims**



13. An interferometer for measuring the spectra of incident electromagnetic radiation, comprising:

a. a rigid frame for supporting the interferometer and including first and second circular cylindrical hollow arms;

b. a fixed mirror assembly having a reflecting surface thereon adjustably mounted to said first arm of said rigid frame;

c. a mirror assembly movably mounted in said second arm of said rigid frame and having a reflecting surface thereon orthogonally disposed to said fixed mirror;

d. a beam splitter mounted between said first and second arms on said rigid frame for separating the incident radiation into two parts and for subsequently recombining the two parts after reflection from the fixed mirror and the movably mounted mirror;

e. means for movably supporting said movably mounted mirror assembly said second arm on said frame;

f. means for providing a center of support for the movable mirror assembly continuously coincident with the center of gravity of said mirror assembly throughout the range of movement, and

g. means mounted on said frame for transporting the movable mirror assembly with respect to the fixed mirror assembly and the beam splitter by providing a force exerted through the coincident center of support and center of gravity, said means mounted on said frame for transporting the movable mirror assembly including a motor disposed solely within said second arm for transporting the movable mirror.

Re. 31,942

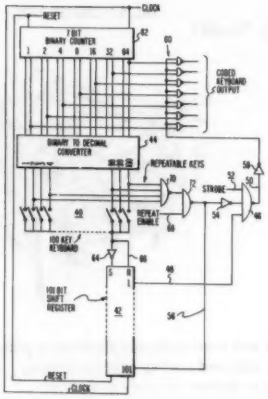
HIGH SPEED SERIAL SCAN AND READOUT OF KEYBOARDS

William G. Klehm, Jr., 31185 Berryhill Rd., Farmington, Mich. 48024

Original No. 3,745,536, dated Jul. 10, 1973, Ser. No. 119,490, Mar. 1, 1971. Application for reissue Jan. 27, 1975, Ser. No. 544,383

Int. Cl.³ G11C *19/00*

U.S. Cl. 340—365 E **24 Claims**



19. A keyboard encoder for generating a signal for each new key depressed in a keyboard having a plurality of keys, whether or not a previously depressed key still remains depressed, comprising:

scanning means for serially scanning each key of the keyboard along a predetermined scan pattern to produce an information train containing one time interval for each of the keys of the keyboard, and containing within each such time interval a signal if the corresponding key is depressed,

a comparison circuit having at least first and second input terminals and an output terminal for generating an output signal during each said serial scan whenever a signal appears on its first input terminal and not on its second input terminal,

a storage device having a storage capacity at least sufficient to store a number of signals equal to the number of keys of the keyboard, the output of said storage device being electrically connected to the second input terminal of the comparison circuit,

circuit means coupling said scanning means to said storage device for supplying said information train to said storage device to store therein information signals corresponding to one complete scan of the keyboard,

circuit means coupling said scanning means to the first input terminal of said comparison circuit for supplying said information train serially to said first input terminal as the keyboard is being scanned, and

means for advancing out of the storage means, to the second input terminal of the comparison circuit, the information train then stored in the storage device from the previous scan of the keyboard, synchronously with the signal information being received by the first input terminal from the current serial scan of the keyboard,

the output terminal on said comparison circuit generating a key-detect signal when said first input terminal receives a signal from the present scan of the keyboard while the second input terminal fails to receive a signal from the corresponding key in the previous scan.

Re. 31,943

MULTICHANNEL COHERENT RECEIVER

Patrick J. Ready, Woodland Hills, Calif., assignor to Typologics, Inc., Los Angeles, Calif.

Original No. 4,204,165, dated May 20, 1980, Ser. No. 901,328, May 1, 1978. Application for reissue May 18, 1982, Ser. No. 379,562

Int. Cl.³ H04B *17/00*

U.S. Cl. 455—226 **29 Claims**

22. A method for receiving a selected bandwidth of radio frequencies and for providing time coverage without time gaps of signals appearing in the selected bandwidth comprising the steps of:

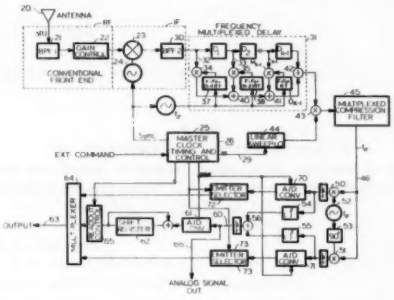
producing from a source of received signals, multiple representations of the selected bandwidth of radio frequencies by introducing a selected bandwidth of radio frequencies into a plurality of different signal paths;

frequency value shifting the multiple representations of the selected bandwidth repeatedly over a predetermined period of time, the magnitude of frequency value shifting varying over the predetermined period of time as a function of time;

dispersively time delaying the frequency shifted signal representations of the selected bandwidth over a range of time delay values, the time delay having a predetermined function of their frequency value;

time delaying by a discrete amount at least one of said signal representations with respect to other of said signal representations after introduction into said signal path;

compensating for the phase difference between each of said representations resulting from the steps of time delaying and dispersively delaying said representations; and



combining the results of the foregoing method steps to produce an output which preserves the amplitude and phase characteristics of the signals appearing within the selected bandwidth.

PLANT PATENTS

GRANTED JULY 9, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,508
APPLE TREE

Norman A. Chick, Monmouth, Me., assignor to James L. Glazier, Monmouth, Me.

Filed Apr. 21, 1983, Ser. No. 487,051
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of dwarf size and maintenance of that size throughout its productive life, crotch angles between 72 and 90 degrees consistently, little or no training being required to maintain such crotch angles, short intervals between nodes, ability to propagate on seedling and certain rootstocks for excellent anchorage, adaptability to wide range of soil conditions and the production of fruit which is typical of the red McIntosh known as Rogers, the tree being vigorous, round and spreading with small laterals, and hardy.

5,509
ALSTROEMERIA NAMED STALPATRI

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij and M. C. van Staaveren, Aalsmeer, Netherlands

Filed Aug. 10, 1983, Ser. No. 521,887
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive alstroemeria variety, substantially as herein shown and described, characterized by the distinctive empire rose-and indian yellow coloration of its medium sized and profusely blooming flowers.

5,510
ALSTROEMERIA NAMED STALPAS

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij and M. C. Staaveren, Aalsmeer, Netherlands

Filed Aug. 10, 1983, Ser. No. 521,889
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive alstroemeria cultivar, substantially as herein shown and described, characterized by the purple-violet coloration of its large and profusely blooming flowers which have an excellent lasting quality.

5,511
CARNATION NAMED LONDETON

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe SCS Barberet & Ducloux, La Londe, France

Filed Jul. 25, 1983, Ser. No. 516,569
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new variety of spray carnation, substantially as herein shown and described, characterized by the profuse production of its medium sized blooms of a light pink color; by its advantageous growth habit; and by its resistance to *Fusarium oxysporum.*

5,512
CARNATION NAMED LONPILEM

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe SCS Barberet and Ducloux, La Londe, France

Filed Jul. 25, 1983, Ser. No. 517,213
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct carnation cultivar, substantially as herein shown and described, characterized by the pink coloration of its medium sized blooms which are carried on long, strong, stiff stems; and by its advantageous tall growth habit, and its abundant production of flowers during its Spring and Fall blooming seasons.

PATENTS

GRANTED JUL. 9, 1985

ERRATA

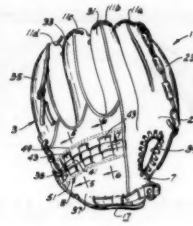
For	See
623–012	4,527,293
623–006	4,527,294
446–202	4,527,351
118–029	4,527,660
354–400	4,527,880
425–042	4,527,946
464–183	4,527,978
525–530	4,528,127
422–102	4,528,187
514–012	4,528,189
514–012	4,528,190
514–063	4,528,191
514–078	4,528,193
514–255	4,528,194
514–396	4,528,195
514–533	4,528,196
514–552	4,528,197
052–555	4,528,320
526–062	4,528,336
526–070	4,528,337
526–113	4,528,338
526–127	4,528,339
528–026	4,528,343
514–539	4,528,393
514–400	4,528,397
378–047	4,528,657

PATENTS

GRANTED JULY 9, 1985

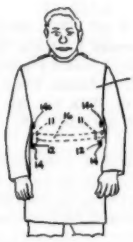
GENERAL AND MECHANICAL

4,527,287
BASEBALL GLOVE OR MITT
Akio Aoki, Osaka, Japan, assignor to Figgie International Inc., Willoughby, Ohio
Filed Jun. 24, 1983, Ser. No. 507,518
Int. Cl.³ A41D *13/10*
U.S. Cl. 2—19 **20 Claims**



1. A baseball glove having an outer shell comprising front and a back plies joined together to form thumb and finger stalls and a hand-receiving pocket, said glove being a fielder's glove having four finger stalls separated by intervening crotches, a web between the thumb stall and adjacent (index) finger stall, a hand-receiving opening at the bottom of the glove providing entry into the shell, the back ply of the shell in the area between said stalls and the bottom of the glove being substantially closed for substantially covering the back of the hand of a person wearing the glove, a closed portion of the back ply in said area having a flexibility greater than the remainder of said area for enabling the glove readily to flex when the hand is flexed to close the glove.

4,527,288
RADIOLOGY APRON HAVING A WAIST SUPPORT MEANS
Richard B. Hoffman, 73 Portugese Bend Rd., and Jonathan B. Po, 68 Portugese Bend Rd., both of Rolling Hills, Calif. 90274
Filed Jun. 29, 1984, Ser. No. 626,543
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—48 **4 Claims**



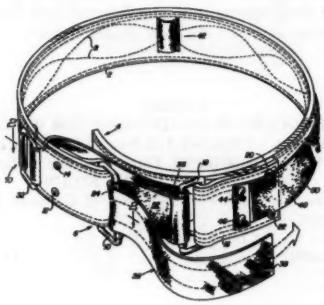
1. In a radiology apron for protecting the user thereof from ionizing radiation said apron having shoulder straps for supporting the apron on the user's shoulders, the improvement being means for supporting a portion of the weight of said apron on the waist area of the user comprising;

a bracket having first and second arm means spaced from each other in opposing relationship;

means retained on the body of the user in the general waist area of such user for receiving said first arm means in retention thereon; and

means for retaining said apron to said second arm means at a position thereon whereat a portion of the load of said apron is transferred to said bracket said retaining means comprising an eyelet installed in the apron and forming an aperture extending through the apron from one side to the other thereof, and a hook attached to the second arm means and extending outwardly therefrom, said hook being fitted through the aperture formed in the eyelet.

4,527,289
BRACE INCORPORATING PULLEY MECHANISM
Lance L. Shea, 2933 N. 83rd St., Scottsdale, Ariz. 85251
Continuation-in-part of Ser. No. 189,070, Sep. 22, 1980. This application Apr. 19, 1982, Ser. No. 369,536
Int. Cl.³ A41F *3/00;* **A61F** *5/04*
U.S. Cl. 2—322 **5 Claims**



1. A brace for supporting or immobilizing a portion of the human body comprising:

a. a wrap, having first and second ends, for encompassing a portion of the body;

b. a flexible strap having a first end secured to said wrap proximate the second end thereof, said flexible strap having a free end opposite the fixed end;

c. first means secured to said wrap proximate the first end thereof for engaging said flexible strap at a first point disposed between the fixed end and free end thereof;

d. second means secured to said wrap proximate the second end thereof for engaging said flexible strap at a second point disposed between the first point and the free end thereof;

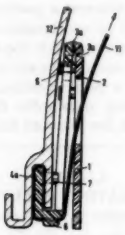
e. said flexible strap, said first means, and said second means forming a pulley arrangement for tightening said wrap when the free end of said flexible strap is pulled; and

f. means to secure said wrap when tightened.

4,527,290
INTERNAL STRUCTURE FOR A PROTECTIVE HELMET
Christian Zahn, Brunswick, Fed. Rep. of Germany, assignor to Schuberth-Werk GmbH & Co. KG, Brunswick, Fed. Rep. of Germany
Filed Mar. 14, 1983, Ser. No. 475,101
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209192
Int. Cl.³ A42B *3/00*
U.S. Cl. 2—416 **12 Claims**

1. An inner structure for a protective helmet having a helmet shell, comprising a plurality of belt straps forming a spider and

each having an end; a plurality of plug-in fasteners each corresponding to the respective belt strap and formed of plastics, each of said fasteners having a shackle-shaped portion connected to the end of the respective belt strap and adapted to be attached to a helmet shell; a head bearing ring formed of plastics; and a plurality of hinge joints each connecting each plug-in fastener to the head bearing ring so that each fastener is pivoted relative to the head ring to be positioned against the latter, said head bearing ring, said fasteners and said hinge joints together forming a one-piece plastic element.



4,527,291

SAFETY GOGGLES, IN PARTICULAR FOR WORK USE

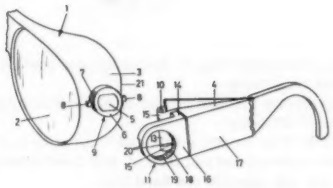
Walter Nussbickl, Wachendorf, Fed. Rep. of Germany, assignor to Uvex Winter Optik GmbH, Fürth, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,170

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 8302644[U]

Int. Cl.³ A61F *9/02*

U.S. Cl. 2—450 **12 Claims**



1. Safety goggles including temples disposed on and inclinable relative to a frame having lenses and side guards, comprising:

swivel bearing means defined by a platelike protrusion integrally formed on said side guards of said frame and including a ring member having abutments positioned opposite each other on the periphery of said ring member, said ring member being secured to the outer periphery of said platelike protrusion of said swivel bearing means;

swivel bearing appendage means connected to each of said temples, each of said swivel bearing appendage means being inherently elastic and having inner swivel bearing recesses for cooperative mating with said abutments on said ring member of said swivel bearing means, said recesses being adapted to lock said swivel bearing appendage means to said side guards of said frame, said swivel bearing appendage means being inclinable with respect to a plane perpendicular to said side guards of said frame;

said temples and said swivel bearing appendage means defining a subassembly and a portion of said subassembly gripping said side guards of said frame from behind in a form fitting manner to secure said subassembly to said side guard of said frame.

4,527,292

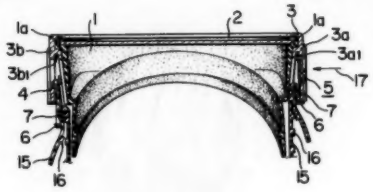
LOCKING MEANS FOR A FIXING BAND OF A DIVING MASK

Masatoshi Kasama, Chiba, and Kohzo Nakai, Sarumachi, both of Japan, assignors to Kinugawa Pacific Kabushiki Kaisha, Japan

Filed Jun. 3, 1983, Ser. No. 500,925

Int. Cl.³ A61F *9/02*

U.S. Cl. 2—452 **2 Claims**



1. A locking means for a fixing band of a diving mask, comprising:

two holders, one located at each of two sides of said diving mask, each of said holders having a generally forwardly tapering inside shape formed between a flat inner surface and a flat outer surface at an acute angle therewith, each of said holders having a first generally rectangular aperture at the wider end of said tapered inside shape, and a second generally rectangular aperture in said flat outer surface of said tapered inside shape, respectively;

fastening members, each formed in a generally forwardly tapered shape to fit into said forwardly tapered inside shape of said holders when pressed therein;

integral with each of said fastening members, an end pawl, a generally rectangular opening adjacent said end pawl, a band bar adjacent said rectangular opening, a generally U-shaped opening on another side of said band bar, surrounded on a substantial portion of its periphery by said U-shaped opening, a generally rectangular springy locking member attached to the thin end of said tapered fastening member, the outside surface of said locking member being provided with a plurality of triangular pawls and a front projection respectively; and

a flexible fixing band, formed with a plurality of transverse projections on one side thereof, uniformly spaced to be apart by a distance not less than the width of said band bar.

4,527,293

HYDROGEL SURFACE OF UROLOGICAL PROSTHESIS

Eugene C. Eckstein; Norman L. Block, both of Miami; Jacob Kline, Coral Gables, and Leonard Pinchuk, Miami, all of Fla., assignors to University of Miami, Coral Gables, Fla.

Filed May 18, 1983, Ser. No. 495,698

Int. Cl.³ A61M *25/00*; C08F *220/54*; C08J *7/04*

U.S. Cl. 623—12 **23 Claims**

6. A process for making a urine-contacting physiological compatible article, comprising the steps of:

A. purifying 2-hydroxyethyl methacrylate;

B. adding to said purified 2-hydroxyethyl methacrylate a solvent and from between about 1 and about 3 mole fraction % of methacrylic acid and from between about 0.01 and about 0.5 mole fraction % of a crosslinking agent to form a solution;

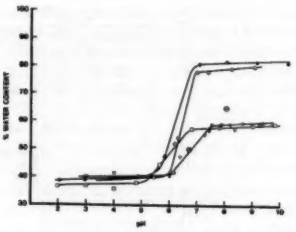
C. forming a hydrogel coating on the urine-contacting surface of a polymeric urological prosthesis by exposing said device to said solution and causing a hydrogel copolymer comprising said 2-hydroxyethyl methacrylate, said methacrylic acid, and said crosslinking agent to form thereon.

15. A physiologically compatible article comprising a polymeric urological prosthesis having a urine-contacting surface coating grafted or interpenetrated thereon, wherein said sur-

face coating comprises a copolymer, said article being formed by:

A. purifying 2-hydroxyethyl methacrylate;

B. adding to said purified 2-hydroxyethyl methacrylate a solvent and from between about 1 and about 3 mole fraction % of methacrylic acid and a crosslinking agent to form a solution;



C. forming a hydrogel coating on the surface of said polymeric urological prosthesis by exposing said prosthesis to said solution and causing a hydrogel copolymer comprising said 2-hydroxyethyl methacrylate, said methacrylic acid, and said crosslinking agent to form thereon.

4,527,294

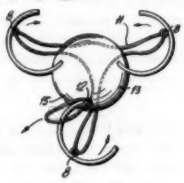
INTRAOCULAR LENS CONSTRUCTION

K. B. Heslin, 36 E. 36th St., New York, N.Y. 10016

Continuation-in-part of Ser. No. 512,312, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 392,511, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 218,694, Dec. 22, 1980, abandoned. This application Dec. 16, 1983, Ser. No. 562,078

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 623—6 **20 Claims**



19. An intraocular lens comprising:

(a) a lens adapted for intraocular insertion and positioning and being comprised of:

(i) a lens body, and

(ii) a plurality of flexible haptics, each of said haptics having a free end portion and a connected end portion permanently and directly secured to the lens body adjacent its periphery, the free end portions of said haptics normally extending away from said periphery of the lens body and being angularly spaced around said periphery; and

(b) means for maintaining at least one of said flexible haptics, prior and during said insertion, in a compressed or loaded position substantially within the space defined by the periphery of said lens body and close to one of the surfaces of said lens body, said periphery, except for said haptics, being devoid of any projections extending away from said periphery whereby, when said haptic is in said loaded position, insertion of said lens assembly into the eye is facilitated, said maintaining means comprising a string, at least said one of said haptics having an eyelet member between said free and connected end portions, said string being looped through the eyelet member of the haptic and being capable of being pulled so that the free end portion of said haptic is drawn into said space defined by the periphery of said lens body, catch means provided on said lens body for detachably holding said string in its pulled condition, said lens body having at least one hole adjacent its periphery, said string extending through said hole.

4,527,295

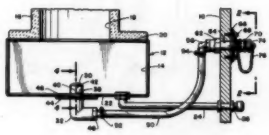
TANK FLUSHING APPARATUS

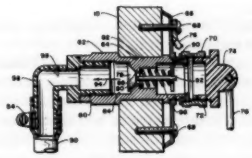
Brian C. Lacore, 9777 Soledad Canyon Rd., Canyon Country, Calif. 91351

Filed Jun. 1, 1984, Ser. No. 616,127

Int. Cl.³ E03D *1/00*

U.S. Cl. 4—321 **11 Claims**





1. In combination with a tank, said tank having an interior chamber, said tank having a bottom wall, contents including solid matter to be deposited within said interior chamber, a drain conduit assembly connected to said tank, said drain conduit assembly being for the purpose of discharging said contents exteriorly of said tank, a tank flushing apparatus connected to said tank, said tank flushing apparatus comprising:

a nozzle assembly mounted through said bottom wall of said tank, said nozzle assembly for dispensing of a liquid within said internal chamber, said nozzle assembly having a nozzle tip, said nozzle tip being located within said internal chamber, said nozzle tip including means for dispersement of said liquid within said internal chamber;

a conduit assembly having an inner end and an outer end, said inner end being connected to said nozzle assembly, said outer end being connected to a connector assembly, said connector assembly being adapted to connect with said liquid, whereby a pressurized amount of said liquid is to be conducted through said connector assembly and said conduit assembly to said nozzle assembly to then be forcibly dispensed within said internal chamber to thereby cause said solid matter to move within said internal chamber into said drain conduit assembly and hence be discharged exteriorly of said tank; and

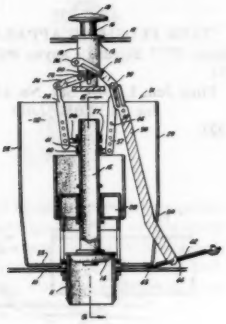
said means for dispersement of said liquid comprising a series of discharge openings, each said discharge opening having a longitudinal center axis, at least some of said longitudinal center axes being located at various angular inclinations relative to said nozzle tip to thereby direct said liquid to different sections of said interior chamber so as to effect even dispersement of said liquid.

4,527,296

SELECTIVE-FLUSH CISTERN

Neil R. Musgrove, New South Wales, Australia, assignor to James Hardie Industries Limited, New South Wales, Australia

Filed Nov. 1, 1983, Ser. No. 547,745
Claims priority, application Australia, Nov. 18, 1982, PF6867
Int. Cl.³ E03D 1/14
U.S. Cl. 4—324 **6 Claims**



1. Selective-flush operating mechanism for use with apparatus including:

a cistern body having a bottom discharge drain aperture and a lid having a hole in it,

a closure valve normally seated on said drain,

a single press-button extending through said hole, valve-lifting means which upon said press-button being depressed cause said closure valve to be lifted from said drain,

a float whereby said closure valve is held elevated once lifted and allowed to reseat on said drain upon conclusion of a flush, and

float-controlled means for water-replenishment of said cistern body; said selective-flush operating mechanism comprising:

(a) an open-top partial-flush pot included within said cistern body, said partial-flush pot containing the aperture of said drain, said closure valve and said float, and having a doorway open to the inside of said body adjacent its bottom;

(b) a normally open door able to close said doorway; and,

(c) a linkage operatively connecting said press-button with said closure valve and said door, such that on lifting said press-button said valve is lifted and said door is closed.

4,527,297

POOL ENTRANCE AND SUPPORTING STRUCTURE

Frederick M. Pettit, 1411 Point Abino Rd. S., Ridgeway, Ontario, Canada L0S 1N0

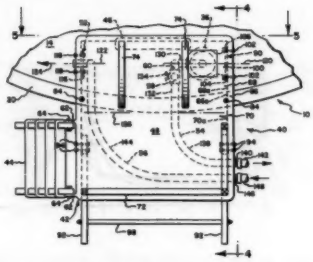
Filed Dec. 16, 1983, Ser. No. 562,415
Int. Cl.³ E04H 3/18
U.S. Cl. 4—496 **13 Claims**

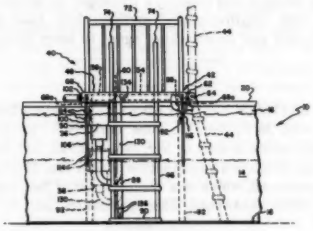
1. A pool entrance and supporting structure for an above-ground pool of the type having a generally vertically extending pool wall about the perimeter of a pool, a pump and filter assembly located externally of said generally vertically extending pool wall, and a return and a skimmer adapted to be mounted within said pool; said pool entrance and supporting structure comprising:

an entrance structure including a pair of spaced apart ladders, one of said pair of ladders being disposable outside of an above-ground pool and the other of said pair of ladders being disposable within said pool, and a platform extending between upper end portions of said pair of ladders, said platform having a first portion adapted to be disposed over the generally vertically extending pool wall and a second portion adapted to be disposed over the surface of the pool;

skimmer support means carried by said entrance structure and capable of supporting a skimmer at least in part below said another portion of the platform;

return support means carried by said mounting structure and capable of supporting a return within said pool; and





a pair of hoses carried by said entrance structure and capable of interconnecting a skimmer and a return with a pump and filter assembly, a portion of said pair of hoses being supported by said platform and passing over the top of the generally vertically extending pool wall

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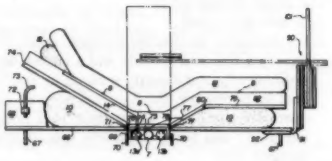
4,527,298

ELECTRO PNEUMATIC BED

Lee A. Moulton, 5081 Keane Dr., Carmichael, Calif. 95825

Filed Mar. 18, 1982, Ser. No. 359,617
Int. Cl.³ A61G 7/06
U.S. Cl. 5—66 **14 Claims**



1. A pneumatically adjustable bed comprising, in combination:

plural pneumatic air bladders disposed on surfaces of mattress means,

a pneumatic unit with a remote control to inflate and deflate said bladders provided with connecting means to transmit air from said pneumatic unit to said bladders,

actuating means on said remote control to activate said pneumatic unit,

means for fastening said plural bladders such that in use and inflation said bladders do not migrate,

and a hinged bed board placed underneath said mattress pad wherein said pneumatic unit comprises a blower with an electric motor mounted inside a manifold which selectively directs air through at least one two position pneumatic valve into said connecting means and thereafter to said bladders wherein said connecting means comprises pneumatic air lines with nipples wherein said nipples are provided with reeds to provide a noise when air passes therethrough wherein said remote control selectively actuates plural said pneumatic valves thereby controlling which bladders are inflated or deflated wherein said means for fastening comprises tethers and straps interconnecting plural said bladders and said mattress means wherein said valves comprise in combination a cylindrical body with end plugs with central apertures therein to receive a first hollow thrust rod, one end of which flares into a hollow cylinder with provided on an outer surface with peripherally disposed longitudinally extending keys which mate with linear keyways on an inner surface of said body and further provided on a forward edge with a crenellated lip with bevelled crenels which engage bevels on a cap of a second hollow rod biased towards said first rod by a spring whereby pressing said second rod inwardly rotates said flared cylinder on said first rod said keys alternately engaging a keyway with a stop and then a keyway without a stop so that a flap valve on said first rod alternates from a position covering an orifice to a remote position thereby allowing air to enter said orifice.

4,527,299

METHOD FOR FORMING AN INTERNAL THREAD IN A HOLLOW BODY

Torben Bredal, Gilleleje, Denmark, assignor to Aktieselkabet J.H. Holm Holding, Ebberup, Denmark

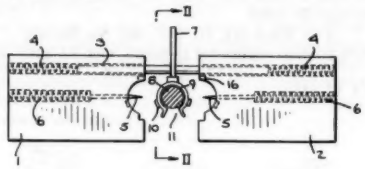
PCT No. PCT/DK 83/00012, § 371 Date Oct. 3, 1983, § 102(e) Date Oct. 3, 1983, PCT Pub. No. WO83/02741, PCT Pub. Date Aug. 18, 1983

PCT filed Oct. 3, 1983, Ser. No. 540,550

Claims priority, application Denmark, Feb. 4, 1982, 475/82

Int. Cl.³ B23G *7/00*; B21D *53/24*

U.S. Cl. 10—152 R **4 Claims**



1. A method of forming an internal thread in a hollow cylindrical body formed from a metal plate bent around a longitudinal axis into a tube, with opposite edges of the plate being spaced apart to provide a longitudinal gap therebetween when the tube is unstressed, the method comprising the steps of:

(a) introducing the tube between at least two clamping jaws, each jaw having a resiliently yieldable member extending inwardly toward a central axis between the jaws;

(b) moving the jaws radially inward toward the central axis until the resiliently yieldable members supportingly contact the tube to hold said tube coaxially with a tap having a thread-forming head and a supporting shank smaller in diameter than said head;

(c) moving the clamping jaws axially with respect to the tap to position the tube around the shank of the tap;

(d) closing the clamping jaws together against the tube to close the longitudinal gap between the spaced apart edges of the tube and to fix the tube in the jaws;

(e) rotating the tap in a direction to unscrew the tap from the tube;

(f) withdrawing the thread-forming head of the tap from the tube while the tap is rotating in said direction to unscrew the tap from the tube, thereby forming an internal thread in said tube; and

(g) opening the clamping jaws to release the tube.

4,527,300

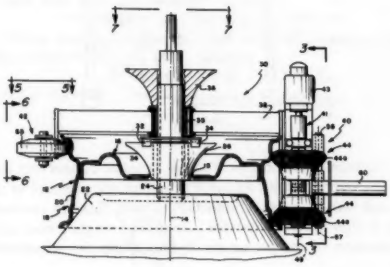
APPARATUS FOR CLEANING THE BEAD SEATING PROFILE OF A TIRE RIM

Wayne C. Kunde, 2945 Brush Rd., Richfield, Ohio 44286, and Martial J. Robitaille, Bedford, Ohio, assignors to Wayne C. Kunde, Richfield, Ohio

Filed Oct. 12, 1983, Ser. No. 541,012

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—21 C **14 Claims**



3. Apparatus for cleaning the annular bead seating profile of a tire rim, the bead seating profile being integral with the tire rim and circumscribing the central axis of the tire rim, said apparatus comprising means for supporting the tire rim with the central axis of the rim disposed in a predetermined orientation, a cleaning brush rotatable about an axis of rotation, means for rotating the cleaning brush about said axis of rotation, means for supporting the cleaning brush in an orientation in which it engages the bead seating profile at the outer peripheral surface of the tire rim as the cleaning brush rotates about its axis of rotation for maintaining the cleaning brush under a predetermined state of pressure against the bead seating profile of the tire rim, the tire rim and the cleaning brush also being supported in such a manner that the cleaning brush can orbit relative to the outer peripheral surface of the tire rim while the cleaning brush is maintained in said predetermined orientation and in said predetermined state of pressure against the bead seating profile of the rim, to effect cleaning of the bead seating profile of the tire rim as the cleaning brush rotates about its axis of rotation and orbits relative to the outer peripheral surface of the tire rim, said means for supporting said cleaning brush including pressure means coupled with said cleaning brush and engageable with the outer periphery of a tire rim at a location that is spaced from the cleaning brush about the periphery of the rim, the spacing between the pressure means and the cleaning brush being adjustable to adjust the pressure of the cleaning brush against the bead seating profile of the tire rim, and means for selectively adjusting the spacing between the pressure means and the cleaning brush to adjust the pressure of the cleaning brush against the bead seating profile of the tire rim.

4,527,301

SIDE VIEW MIRROR TRUCK WINDSHIELD WIPER

John E. Seitz, 1845 Center, High Ridge, Mo. 63049

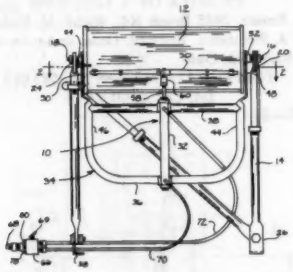
Filed May 14, 1984, Ser. No. 610,126

Int. Cl.³ B60S *1/10*

U.S. Cl. 15—250 B **11 Claims**

1. A windshield wiper for a side view mirror for trucks in which the side view mirror is pivotally supported by a pair of lug elements extending from the top and bottom of the mirror and pivotally connecting the mirror to a mirror support frame connected to a cab of the truck, said windshield wiper comprising a windshield wiper support frame pivotally connected

to said lug elements and having a body portion extending between the mirror and the cab, a pneumatic cylinder rigidly connected and moveable with said wiper support frame, a reciprocable piston supported within said cylinder having an external operating rod, means for connecting an external end of said operating rod to a windshield wiper blade engageable



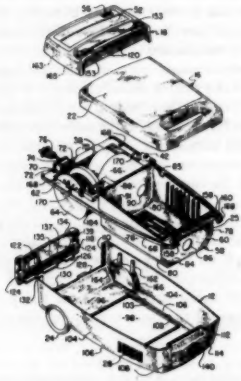
with a surface of the mirror, flexible conduit connecting said pneumatic cylinder with a source of pneumatic pressure in the truck and valve means connected to said flexible conduits located within the truck cab for providing a single throw push pull operation of the pneumatic cylinder and the windshield wiper.

4,527,302

CANISTER CLEANER

Edgar A. Maurer, Canton, and John D. Essex, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Nov. 21, 1983, Ser. No. 553,972
Int. Cl.³ A47L *5/36*
U.S. Cl. 15—325 **7 Claims**



1. A canister cleaner including a bottom shell and an intermediate member including;

(a) said bottom shell having an enlarged non-circular aperture through its bottom portions,

(b) said intermediate member forming a bag cavity and having an enlarged non-circular projecting portion on its bottom side closely interfilling with said aperture whereby said intermediate member and bottom shell are positively located relative to one another.

4,527,303

DOOR STOP HAVING MULTIPLE MOUNTING POSITIONS

Gennaro Civitelli, 336 Mountain Rd., Hamden, Conn. 06514

Filed Sep. 15, 1983, Ser. No. 532,601
Int. Cl.³ E05D *3/06, 11/06*
U.S. Cl. 16—86 B **10 Claims**

1. A door stop for mounting on a hinge pin of a hinged door comprising:

a single piece body including three apertures for receiving said hinge pin, each aperture having an axis about which said body may pivot when said pin is mounted in said aperture;

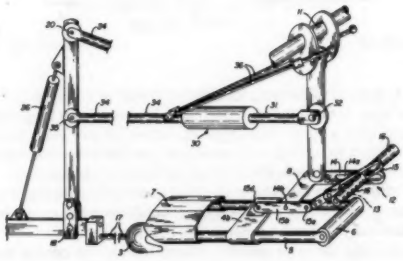
two bumpers secured with respect to said body, each said bumper being spaced from the other bumper, and each bumper spaced from each said aperture axis to define for each said aperture an angle between said axis and said bumpers thereby defining three such angles, each said angle being substantially different than the other two angles to provide for at least three mounting positions of said door stop on said pin.

4,527,304

APPARATUS FOR AUTOMATIC CLEANING OF KILLED POULTRY

Henrik Ullum, 1 Lykkeholmsallé , DK-2690 Karlslunde, Denmark

PCT No. PCT/DK82/00096, § 371 Date Jun. 9, 1983, § 102(e) Date Jun. 9, 1983, PCT Pub. No. WO83/01367, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 21, 1982, Ser. No. 509,461
Claims priority, application Denmark, Oct. 22, 1981, 4677/81
Int. Cl.³ A22C *21/06*
U.S. Cl. 17—11 **11 Claims**



1. Apparatus for automatic cleaning of killed poultry, particularly broilers, and having a support (1) arranged to receive a poultry, a fixing mechanism (2) acting with the support (1) for releasably fixing the poultry in a predetermined position with respect to the support (1), a cleaning tool (3) movable into and out of the abdomen of the poultry body for loosening and extracting intestines and giblets, and a movable sensing means (4) acting with the cleaning tool (3) for identifying the length of the body, characterized in that the sensing means (4) is arranged to be moved in a first motion along the neck end of

the body into engagement with the collar bone (clavicle) of the body, that the cleaning tool (3) is arranged to be moved in a second motion into the body, and that the total length of both motions is a constant.

4,527,305

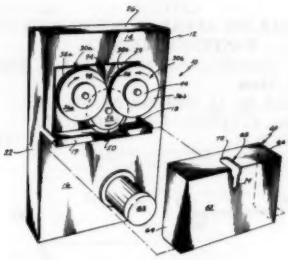
TENDON CUTTER

Eugene G. Martin, New Holland, and Dale M. Risser, Denver, both of Pa., assignors to FoodCraft Equipment Company, Inc., New Holland, Pa.

Filed Jan. 16, 1984, Ser. No. 570,899

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11.3 **7 Claims**



1. Apparatus for at least partially severing the tendons of a bone-containing anatomical section, one extremity of said section being composed principally of bone and tendon, said apparatus comprising:

at least a pair of rotatable discs positioned so as to form a nip between the adjacent peripheries thereof adapted to receive said extremity, the spacing between said discs at the point of closest adjacency being less than the diameter of the bone, establishing within the wider portion of said nip a tendon stripping station and within the narrower portion of said nip a tendon severing station;

means for rotating said discs such that the peripheries thereof move in the same direction at said nip; and

means positioned at said tendon severing station for at least partially severing said tendons, rotation of said discs stripping at least portions of said tendons from said extremity when said extremity is placed in said stripping station and causing said tendon portions to contact said severing means at said severing station.

4,527,306

SPINNING PREPARATION SYSTEM AND METHOD FOR AIR-CONDITIONING THE SAME

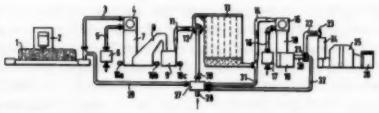
Axel Thannheiser, Moschendorf, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,478

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228672

Int. Cl.³ D01G *37/00*

U.S. Cl. 19—66 CC **27 Claims**



1. In a method for air-conditioning a spinning preparation system composed of a plurality of different types of fiber processing machines that are disposed in at least one room in a spinning plant and that are connected sequentially together by means for transporting fiber in order to sequentially perform a plurality of different processes on the fiber, each processing machine of the sequence having a fiber-carrying region, wherein conditioned air leaving an air-conditioning system enters the spinning preparation system, the improvement comprising introducing conditioned air from the air-conditioning system directly into the fiber carrying region of more than one fiber processing machine of the sequence, without first circulating the conditioned air through said at least one room.

4,527,307

WASTE COLLECTOR FOR A CARD

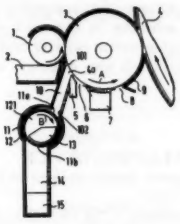
Paul Teichmann, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,717

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306891; Dec. 5, 1983, 3343936

Int. Cl.³ D01G *15/82*

U.S. Cl. 19—105 **11 Claims**



1. In an apparatus for removing waste from a card having a feed table on which fiber material is advanced, a licker-in receiving fiber material from the feed table and a carding cylinder receiving fiber material from the licker-in; said apparatus including means defining an opening in a lower zone of said licker-in; vacuum means for drawing away waste from said card; the improvement comprising

(a) a rotary perforated component supported spaced from said licker-in in the lower zone thereof;

(b) means forming part of said vacuum means and situated within said perforated component for drawing air through said perforated component; and

(c) means defining a connecting chamber extending from said opening to said perforated component for providing a passage of air and waste drawn by said vacuum means.

4,527,308

SHIELD

Victor R. Tritton; Gary E. Tritton, both of Pointe Claire, and Francis Chevillard, St. Francois, all of Canada, assignors to Les Entreprises Tritton Ltee, Montreal, Canada

Filed Oct. 17, 1983, Ser. No. 542,599

Claims priority, application Canada, Oct. 27, 1982, 414258

Int. Cl.³ B65D *77/10*

U.S. Cl. 24—30.5 R **11 Claims**

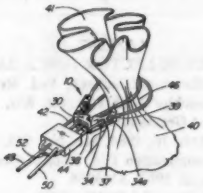
1. A device for closing the mouth of a flexible container comprising:

a body portion having first and second gripping arms extending from opposed ends of said body portion, the first and second gripping arms each being adapted to be folded about a fold line relative to said body portion whereby said arms, with said body portion, are capable of at least partially encircling the mouth of said flexible container for closure thereof;

each of said first and second gripping arms having at least one gripping and engaging means extending inwardly therefrom; said body portion having an upper inwardly extending grip-

ping and engaging means adapted to fixedly engage the flexible container in one direction towards said first gripping arm;

said body portion further having a lower inwardly extending gripping and engaging means spaced from said upper gripping and engaging means adapted to fixedly engage said flexible container in a second opposed direction towards said second gripping arm; and



means provided in at least one of said body portion and said gripping arms for passage of a tie member operatively associated therewith; whereby in use, said upper and lower gripping and engaging means on said body portion hinder rotation of said device in any direction around a flexible container.

4,527,309

CLASPING DEVICE

Akira Kawahara, Kagawa, Japan, assignor to Ryusyo Industrial Co., Ltd., Osaka, Japan

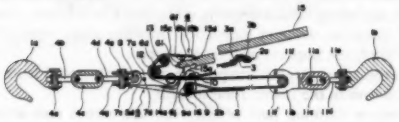
PCT No. PCT/JP82/00268, § 371 Date Feb. 24, 1983, § 102(e) Date Feb. 24, 1983, PCT Pub. No. WO83/00303, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 15, 1982, Ser. No. 474,638

Claims priority, application Japan, Jul. 16, 1981, 56-111599

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—68 CD **11 Claims**



1. A clasping device, comprising

a lever having spaced apart first side walls having facing first interior sides and respective first exterior sides opposite said first interior sides;

a body having spaced apart second side walls having facing second interior sides and respective second exterior sides opposite said second interior sides;

a pair of spaced apart links, each having respective first and second ends;

pivot shafts, having a first pivot axis, pivotally connecting said pair of links at said first end to said first side walls of said lever at said first exterior sides;

a first connecting shaft having a second pivot axis, pivotally connecting said pair of links at said second end to said second side walls of said body at said second interior sides;

a first hook;

a connecting member connecting said hook to said first connecting shaft;

a belt turning shaft and a belt pressing shaft, each fixed between said first side walls of said lever;

a second hook outside said lever; and

a belt successively extending from one side of said belt outside of said lever, over said belt pressing shaft, turned about said belt turning shaft, and again extending over said belt pressing shaft to the other end of said belt outside said lever, said other end of said belt being coupled to said second hook;

said lever and said pair of links being respectively concurrently pivotable about said first and second pivot axes between a release position in which said belt is loose and said lever extends in the direction from said first end toward said second end outward of said body, and a fastening position in which said belt turning shaft and said belt pressing shaft are located farther from said second hook than in said release position so that in clasping use said belt is under tension, and in which said lever extends toward said second hook inside said body between said second side walls.

4,527,310

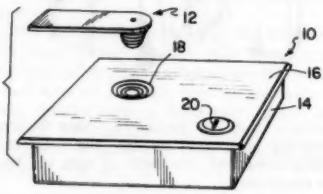
SECURE RELEASE APPARATUS FOR ANTI-THEFT FASTENING DEVICE

Jan Vandebult, Topsfield, Mass., assignor to I. D. Engineering, Inc., Ipswich, Mass.

Filed Jul. 22, 1983, Ser. No. 516,329

Int. Cl.³ B65D *55/10*; H01F *3/12*

U.S. Cl. 24—150 R **11 Claims**



1. A secure release apparatus for use with an anti-theft device, said anti-theft device comprising: a main body having a bore, a pin sized to fit within said bore, a gripping means in said main body for engaging and holding said pin, and disengagement means for disengaging said gripping means, said disengagement means including a member which is movable in response to an applied magnetic field, said secure release apparatus comprising:

a housing comprising a cover plate;

an access opening in said cover plate for receiving said main body;

a permanent magnet structure disposed below said cover plate, said permanent magnet structure producing a concentrated magnetic field sufficiently strong to move said disengagement means member to disengage said gripping means when said body is received in said access opening and said disengagement means member is disposed in said concentrated magnetic field; and

tamper prevention means movable into a first position for preventing said main body from being inserted into said access opening in a manner to move said disengagement means member into said concentrated field, and movable into a second position for permitting said main body to be inserted into said concentrated field, said tamper prevention means comprising: a tamper prevention plate disposed between said cover plate and said permanent magnet structure; motion constraining means connected to said tamper prevention plate for permitting pivotal and limited longitudinal movement of said tamper prevention plate; and a rotatable locking device having a swingable lock arm pivotally connected to said tamper prevention plate wherein said lock arm may be swung by said locking device through a predetermined arc to apply force to said tamper prevention plate through said pivotal connection to move said tamper prevention plate through said pivotal and limited longitudinal movement into either said first position wherein said tamper prevention plate extends across said access opening or into said second position in

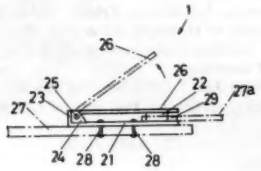
which said access opening is unrestricted by said tamper prevention plate.

4,527,311

MAGNETIC RETAINING DEVICE FOR A BELT

Yoshihiro Aoki, No. 2-9-16, Hanahata Adachi-ku, Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,241
Claims priority, application Japan, Apr. 5, 1983, 58-50560[U]
Int. Cl.³ E05C *17/56*
U.S. Cl. 24—303 **9 Claims**



1. A retaining device comprising:
a fastening belt having two ends,
a base plate having two ends and being attached on an outer surface to one end of the fastening belt,
a permanent magnet being fixed to an inner surface of said base plate near one end of said base plate,
a swingable plate having two ends and being swingably connected at its one end to the other end of said base plate such that the other end of said swingable plate opposes said permanent magnet so that the swingable plate may be moved into and out of contact with said permanent magnet,
a hook ring means, being attached to the other end of the fastening belt, for encircling the permanent magnet so that said swingable plate and said permanent magnet, when held in close contact with each other, cooperate with each other to retain the hook ring means of the fastening belt therebetween.

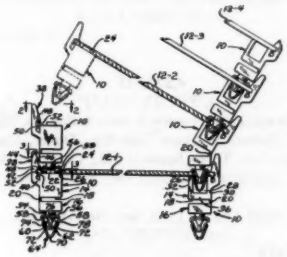
4,527,312

STACKABLE HINGING PRINTED CIRCUIT BOARD SUPPORT

William E. Ruehl, Wheeling, and Joseph P. DeMarco, Park Ridge, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 19, 1983, Ser. No. 524,679
Int. Cl.³ H05K *7/12;* **F16B** *5/06*
U.S. Cl. 24—453 **3 Claims**

1. A one-piece integral panel support of resinous plastic material comprising an upper body and a lower body, said lower body being spaced beneath said upper body and interconnected to said upper body by a thin flexible section providing for shock resistance and forming a hinge for pivoting, means for resiliently fastening said lower body within an opening in a panel and extending below said lower body, said upper body having an upper facing recess, a resilient panel latching arm supported by said upper body above said upper facing recess for holding the edge of a panel, a circular segment pilot upstanding from the upper surface of said upper body adjacent said panel latching arm, and said resiliently fastening means having a slightly smaller transverse dimension than the corresponding transverse dimension of said upper facing recess and



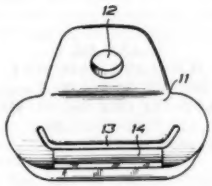
having a wedging means for providing a holding force within an opening in a panel.

4,527,313

ARRANGEMENT IN A LOOP FITTING OR LOCKING TONGUE FOR RETRACTOR-TYPE SAFETY BELTS

Hans Sylven, Vargarda; Leif Ennerdal, Alingsas, and Lars-Eije Berg, Vargarda, all of Sweden, assignors to AB Stil-Industri, Vargarda, Sweden

Filed May 25, 1983, Ser. No. 497,859
Claims priority, application Sweden, May 25, 1982, 8203219
Int. Cl.³ B60R *21/10;* **A44C** *5/18*
U.S. Cl. 24—464 **2 Claims**



1. A low friction guide fitting for use with retractor-type safety belts comprising a metal core member including first means for defining a mounting opening and second means for defining a belt receiving slot, a coating of a first plastic material baked onto said metal core member, said first plastic covering about said slot means, said first plastic coating forming shoulders at the front and rear sides of the fitting, said slot means including at least a lower edge, said first plastic coating including shaped recesses defining shoulders extending below and along said lower edge of said slot means, and an edge lining member comprised of a second plastic material having low friction characteristics, said edge lining being positioned over said lower edge, said edge lining member including hook-shaped marginal portions for engaging said shaped recesses so that when mounted within said slot means, said edge lining member is retained in place and forms a low friction contact surface over which the belt can be easily moved.

4,527,314
Patent Not Issued For This Number

4,527,315
JEWELRY CLASP

Richard H. Sweet, Four Crossman Ave., Attleboro, Mass. 02703; Thomas J. Baker, 36 Cedar Hill Rd., Dover, Mass. 02030; Erick E. Stickel, Three Sundale Rd., Cranston, R.I. 02920, and Emile Gauthier, 113 Lucy Dr., South Attleboro, Mass. 02703

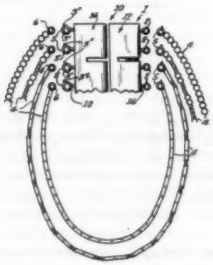
Filed Aug. 3, 1983, Ser. No. 519,916
Int. Cl.³ B65H *57/16*
U.S. Cl. 24—615 **1 Claim**

1. A clasp having a generally tubular body closed at one end and open at the opposite end, said opposite end having a circumferential inturned lip, a catch having a doubled-over strip of spring metal to form a pair of legs that tend to spring apart, each leg having a central longitudinal portion struck outwardly therefrom to provide a bearing surface against the inturned lip when the catch is inserted and withdrawn from the tubular body, one leg of the catch being provided with notches in the side wall thereof adjacent the terminus of the leg, the notches adapted to engage the inturned lip when the catch is fully inserted into the body.

4,527,316
JEWELRY CHAIN-STAY

Joanne Murphy, 6992 NW. 30 Ave., Ft. Lauderdale, Fla. 33309

Filed Mar. 21, 1983, Ser. No. 477,348
Int. Cl.³ F16G *15/00;* **A44C** *5/02*
U.S. Cl. 24—616 **4 Claims**

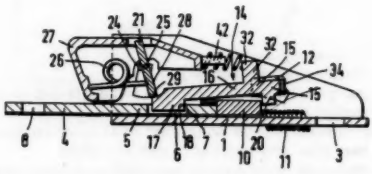


1. A chain fastener system comprising:
a fastener means having a face portion, a rear portion, and opposite lateral portions including a first lateral portion and a second lateral portion;
said first lateral portion including at least two male connector portions;
said second lateral portion including at least two female connector portions;
said fastener means for connecting the ends of a plurality of conventinal ornamental chains each having a closed ring at one end connectable to one said female connector portion and a jump ring at the other end connectable to one said male connector portion;
said fastener means for allowing the chains to hang in concentric tangle-free rows.

4,527,317
BUCKLE FOR A SAFETY BELT

Klaus Straszewski, Quickborn; Erhard Ender, and Herbert Krützfeldt, both of Hamburg, all of Fed. Rep. of Germany, assignors to Autoflug-Stakupress GmbH & Co., Norderstedt, Fed. Rep. of Germany

Filed Jan. 7, 1983, Ser. No. 456,587
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1982, 3200770
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—641 **7 Claims**



1. Buckle for a safety belt, comprising a push-in tongue **(4)** with a locking recess **(6)** and a lock with a push-in path for the push-in tongue **(4)**, the said path being limited at least on one side by guide devices **(1)** and open at its front end, said lock having a locking bar **(13–17)** pivotally mounted in the lock for pivotal movement between a locked position and an unlocked position with a pivot axis which extends transversely to the direction of the push-in path and a locking-bar nose **(18)** which interacts with the locking recess **(6)** in the push-in tongue **(4)** in the locked position to latch the tongue therein and which is movable into the push-in path from the side remote from the guide devices **(1)**, said locking bar **(13–17)** having a projection **(32)** on the side remote from the guide devices **(1)** bearing a first interacting surface adapted for interaction with a corresponding second interacting surface of a slide to pivot the locking bar **(13–17)** out of the locking position, an ejector spring **(11)** urging the locking bar nose **(18)** outwardly from the locking recess **(6)**, a lever **(21)** pivotally mounted in the lock for pivotal movement between a retaining position for securing the locking bar **(13–17)** in the locking position and a nonretaining position allowing the locking bar **(13–17)** to pivot outwardly from the locking recess **(6)**, a spring with a spring force **(26)** interconnected to said lever **(21)** for urging said lever **(21)** into the retaining position, a slide **(27)** movably mounted for movement between a locked and an unlocked position and being guided approximately parallel to the push-in path and located on the side of the latter remote from the guide devices **(1)**, said slide **(27)** bearing a second interacting surface disposed for interaction with said first interacting surface of said locking bar **(13–17)** to pivot the locking bar out of the locking position when the slide is moved to the unlocking position, and elastically flexible means **(31)** for connecting one of said first and second interacting surfaces to said respective bearing locking bar and slide, said elastically flexible means

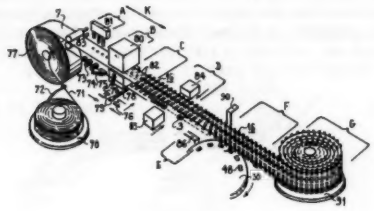
comprising at least one arm extending transversely to the direction of movement of said slide to said unlocked position.

4,527,318

PROCESS AND DEVICE FOR PLACING ELECTRONIC COMPONENTS IN A CASE

Jean Anne, Bagnolet, France, assignor to LCC.CICE-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Dec. 28, 1982, Ser. No. 453,907
Claims priority, application France, Dec. 31, 1981, 81 24586
Int. Cl.³ H01G 7/00
U.S. Cl. 29—25.42 **10 Claims**



1. A device for placing electronic components in cases, comprising:

means for stepwise movement to an encasing station of electronic components having electrical connections supported by a belt;

means for simultaneous stepwise movement to said enclosing station of electronic component cases mounted on a support;

a clamp at said enclosing station, said clamp comprising two jaws movable into contact with one another, said jaws having contacting ends including mating recesses which together define a cavity extending in a first direction, said cavity having cross sections which sequentially correspond, as seen along said first direction, to a first chamfered opening forming a first funnel, to the shape of said case and to a second chamfered opening forming a second funnel;

means for sequentially moving each of said electronic component cases along said first direction through said first funnel and into said cavity;

means for sequentialiy moving each of said electronic components along said first direction through said second funnel and into one of said cases in said cavity; and

means for opening said jaws to release said electrical component in said case.

8. A process for placing electronic components in cases, comprising:

welding electronic components to electrical connections mounted on a movable belt;

sequentially positioning said components and connections above a clamp formed by two relatively movable jaws which together define a cavity having first and second funnel shaped openings;

filling cases with liquid resin;

sequentially positioning each of said cases under said clamp;

sequentially inserting each of said cases through said first funnel shaped opening and into said cavity;

sequentially inserting each of said components through said second funnel shaped opening and into one of said cases in said cavity;

sequentially separating said jaws to release each said inserted component and case;

sequentially retracting said inserted component and case from between said opened jaws; and

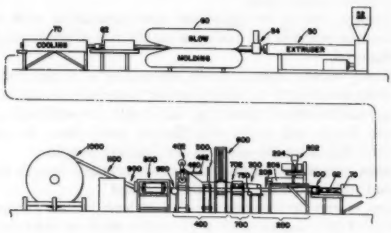
advancing said belt.

4,527,319

METHOD AND APPARATUS FOR MANUFACTURING FOLDABLE CONDUIT

Larry A. Rosenbaum, and H. John Sidaway, both of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Sep. 28, 1981, Ser. No. 306,467
Int. Cl.³ B29C 29/08
U.S. Cl. 29—33 T **57 Claims**



49. An apparatus for manufacturing plastic conduit products which have at least one relatively strong side wall, the manufacturing apparatus comprising:

tubular structure forming means for forming substantially continuously a tubular plastic structure which includes the at least one side wall, the side wall having a plurality of longitudinally extending rows of outward projecting dimples projecting outward therefrom;

dimple severing means for severing the outward projecting dimples, the dimple severing means including a severing blade disposed in longitudinal alignment with each dimple row, each severing blade having a notch disposed generally in line with the corresponding dimple row such that the projections are cut by the notch in the blade;

pulling means for pulling the conduit product from the tubular structure forming means and through the dimple severing means; and,

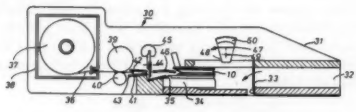
cut off means disposed downstream from the pulling means for selectively cutting off the conduit product, the cut off means including a non-rotating knife blade for cutting the conduit and a fluid driven cylinder for selectively driving the knife blade linearly through the conduit product.

4,527,320

APPARATUS FOR LOADING PLANE FILM CASSETTES IN DAYLIGHT

Hugo F. Deconinck, Deurne-Zuid, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Sep. 22, 1982, Ser. No. 421,418
Claims priority, application United Kingdom, Sep. 28, 1981, 8129269
Int. Cl.³ B23B 7/06
U.S. Cl. 29—33 R **9 Claims**



1. Apparatus for daylight loading plane film cassettes having a central panel for supporting on at least one surface thereof a light sensitive film sheet with the light sensitive side facing outwardly, peripheral flanges rigid with said central panel for overlying the margins of each such supported sheet, slots in said flanges spaced from said central panel for slidably receiving a dark slide parallel with said panel and the film sheet thereon which can be slidably displaced to open the side of the

cassette for exposure of the outwardly facing light-sensitive side of said film sheet, and openable closure means for one end flange through which when open, the sheet can be inserted into and removed from said cassette, said apparatus comprising:

a light-tight housing having an entrance which is fitted with a light-trap and via which said plane film cassette can be introduced into a loading position in said housing with the dark slide on at least one side of said cassette displaced to at least partially open said cassette side and with said closure means open,

a storage station in light-tight communication with said loading position for storing a supply roll of photographic material,

delivery means operative for advancing a predetermined sheet-size length of photographic material from said storage station and for inserting said length through said open end flange and under side flanges partly into the open plane film cassette while in said loading position,

cutting means for cutting said predetermined length from said roll of photographic material, and

means insertable through the thus at least partially opened side of said cassette at an angle to the plane of said sheet to engage the outwardly facing side of said partly inserted film sheet and for further advancing said predetermined length of photographic material into a position wholly within such cassette.

4,527,321

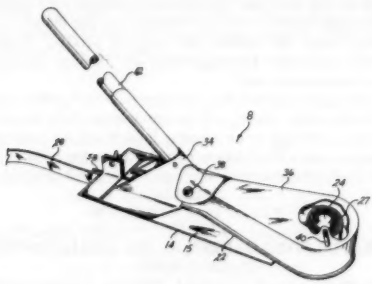
RIBBON JOINT INSTALLER

Leonard L. Paff, 28468 County Rd. 26 W., Elkhart, Ind. 46517

Filed Dec. 1, 1983, Ser. No. 556,774

Int. Cl.³ B23P *25/00*

U.S. Cl. 29—33 R **5 Claims**



1. Apparatus for forming contraction joints in wet concrete, said apparatus comprising a plate adapted to contact and slide across the surface of said concrete, a housing supported by said plate, a depending blade carried below said plate and defining a channel from said housing and through said blade, a supply of ribbon within said housing, said ribbon extending through said channel and exiting said blade below said plate, said blade constituting means for forming a furrow in said concrete as said plate slides across the concrete with said ribbon being pulled from said housing and positioned within said furrow, means for varying the spacing of said ribbon below said plate as it exits said blade.

4,527,322

PROCESS FOR REPAIRING A CUTTING SAW

Arthur R. Jackson, 2742 19th Pl., Forest Grove, Oreg. 97116

Filed Oct. 24, 1983, Ser. No. 544,543

Int. Cl.³ B22D *19/10*

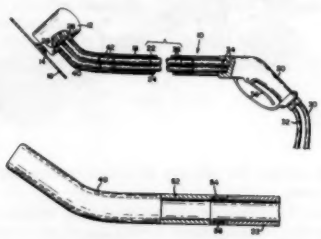
U.S. Cl. 29—402.06 **3 Claims**

1. A process for repairing a cutting saw used for trimming tree limbs from around power lines wherein the cutting head of the saw is powered by hydraulic fluid from rigid hydraulic fluid tubes extending through an elongated rigid non conductive sleeve that extends between an operator's handle and the cutting head of the saw, said tubes having tube end sections that become frequently damaged by vibration, which process comprises;

disengaging the rigid sleeve from the power head of the saw and removing a fluid tube having a damaged area near one end,

severing from the tube an end section of a determined length that includes a damaged area, and forming thereby a new fluid tube end, said severed end section and said new end having similar determined wall thicknesses and similar determined inside and outside diameters,

reducing by about half the wall thickness of a substantial end portion of the new end, said reduction produced by one of the processes of the two processes including; removing



material from the inside of the wall to increase the inside diameter; and removing material from the outside of the wall to reduce the outside diameter,

providing a tubular tip having a body portion with a wall thickness, inside and outside diameters, and a length corresponding to the severed end section, and further having a reduced end portion of a length corresponding to the substantial reduced end portion of the new tube end, said reduced end portion of the tip being mated to the reduced end portion of the new tube end for male-female coupling relationship,

interfitting and bonding the tubular tip to the new end portion of the tube to regenerate the damaged end section, and

mounting the repaired fluid tube in the rigid sleeve and mounting the sleeve between the cutting head and operator's handle.

4,527,323

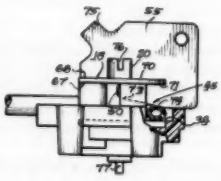
TUBING LOADING KEY

John R. Dawson, Barrington, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Oct. 11, 1983, Ser. No. 540,806

Int. Cl.³ B23P *11/02, 19/02;* **F04B** *43/08*

U.S. Cl. 29—451 **12 Claims**



1. A method of installing a flexible flow tube in a cavity in a peristaltic pump between compression rollers on a rotor and a

reaction member on a pump housing, said method comprising the steps of:

aligning the tube over the cavity,

interconnecting the key and the rotor

contacting the tube with a key and rotating the key having a portion connected to the rotor, and

forcing an engaged portion of tube with the key into the cavity as the key is turned and cams the tube to compress the tube between the compression rollers and the reaction member.

4,527,324

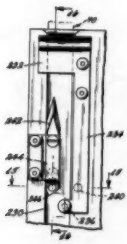
LEADLESS CHIP PLACEMENT MACHINE FOR PRINTED CIRCUIT BOARDS

Welbley J. Dean, Binghamton; Charles E. Johnson, Whitney Point, and Phillip A. Ragard, Binghamton, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Division of Ser. No. 260,990, May 6, 1981, Pat. No. 4,458,412. This application Apr. 25, 1984, Ser. No. 603,905

Int. Cl.³ H05K *3/30*

U.S. Cl. 29—564.6 **1 Claim**



1. In an apparatus for population of circuit boards with electronic components which are supplied in tapes having a front, back, length, feed holes and apertures spaced along said length and covers on said front and back to enclose the components in said apertures, the improvement comprising:

carousel means, rotatable about a vertical axis, for supporting plural peripherally spaced supply tapes for vertical feed generally parallel to said vertical axis;

registration means for guiding each of said supply tapes;

drive means for rotating said carousel means about said vertical axis, upon command, to position a selected registration means and tape at a pick-up station;

feed means for engaging said feed holes and indexing downwardly to position a component for pick-up at said pick-up station;

cutter means mounted on said registration means for splitting said front cover longitudinally during said feeding, said cutter means positioning said component against said back cover for pick-up; and

pick-up assist means for displacing a component from said back cover during said pick-up.

4,527,325

PROCESS FOR FABRICATING SEMICONDUCTOR DEVICES UTILIZING A PROTECTIVE FILM DURING HIGH TEMPERATURE ANNEALING

Henry J. Geipel, Jr.; Charles A. Schaefer; Francis R. White, all of Essex Junction, and John M. Wursthorn, Underhill Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

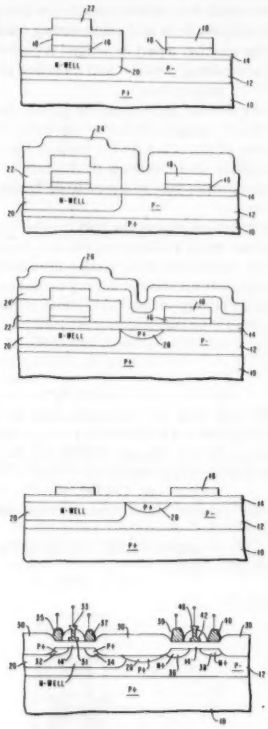
Filed Dec. 23, 1983, Ser. No. 564,880

Int. Cl.³ H01L *21/265, 21/31*

U.S. Cl. 29—571 **7 Claims**

1. A process of fabricating a semiconductor structure wherein said structure has to be exposed to oxidizing conditions during certain processing steps and wherein said structure includes regions which react differently in the presence of such oxidizing conditions, comprising:

covering said structure with a sacrificial layer of a material which oxidizes uniformly under said oxidizing conditions;



exposing said structure to said oxidizing conditions to thereby cause formation of an oxide layer only on said sacrificial layer; and

completely removing said oxide layer and thereafter completely removing said sacrificial layer.

4,527,326

PART FEEDING AND ASSEMBLING SYSTEM

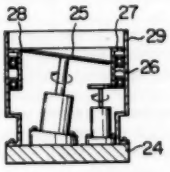
Michinaga Kohno, Tokyo; Koichi Sugimoto, Hiratsuka, and Yasuo Nakagawa, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,676

Claims priority, application Japan, Nov. 24, 1982, 57-204641

Int. Cl.³ B23P *21/00*

U.S. Cl. 29—705 **5 Claims**



1. A part feeding and assembling system, comprising:

(a) a bowl feeder composed of storage means for storing parts and a transporting track member for transporting the parts stored in the storage means in the form of at least a row, said transporting track member having a terminal end opening into the interior of said storage means;

(b) visual recognition means for imaging the parts being transported on said transporting track member, determining whether a part as imaged is proper for assembling, and recognizing position and direction of the part determined to be proper; and

(c) a robot for picking up the proper part recognized by said visual recognition means by generating pick-up position data of the robot on the basis of the data representing the position and direction of the proper part and assembling said proper part to a part to be assembled at another location;

said robot taking out the part proper for the assembling from those being transported on said transporting track member, while said bowl feeder introduces a part determined improper for the assembling to said storage means through said opening formed at the end of said transporting track member so that said part is again placed on said transporting track member to be recirculated.

4,527,327

DEVICE FOR TRANSFERRING AN ELECTRIC OR ELECTRONIC COMPONENT TO A MOUNTING BOARD

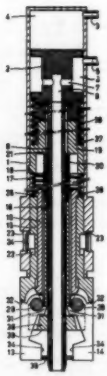
Fransiscus H. Van Deuren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,196

Claims priority, application Netherlands, Apr. 16, 1982, 8201593

Int. Cl.[3] **B23P** *19/00;* **H05K** *3/32*

U.S. Cl. 29—740 **7 Claims**



1. A device for transferring a component, comprising

a suction tube for picking up a component,

gripping means for aligning and centering the component, said means comprising two pairs of oppositely arranged jaws, and

a holder in which said suction tube is axially movable with respect to the holder and the gripping means,

characterized by comprising means for opening and closing said jaws in response to movement of the tube with respect to the holder, said means comprising

a support in which the jaws are pivotally mounted, said support being movable axially with respect to the holder,

an abutment on said tube,

means engageable by said abutment for moving the support in response to movement of the tube, and

means for closing said jaws in response to movement of the support with respect to the holder, said means including means for closing one pair of jaws earlier than the other.

4,527,328

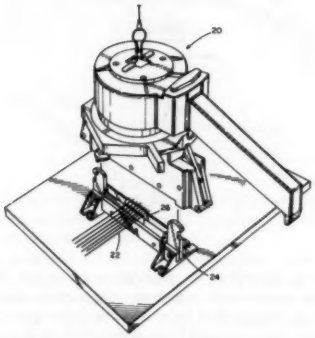
PORTABLE MASS TERMINATION TOOL

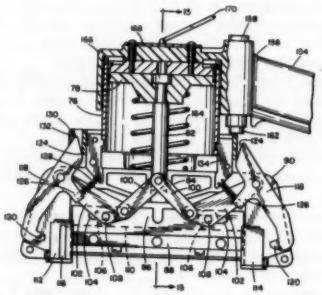
Roy A. Moody, Flossmoor; Peter Kirsinas, Country Club Hills, and James A. Turek, LaGrange, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Dec. 27, 1982, Ser. No. 453,669

Int. Cl.[3] **B23P** *19/04*

U.S. Cl. 29—749 **17 Claims**





1. A portable tool for simultaneously terminating a plurality of conductors in a mass termination, insulation displacement connector positioned in a connector holder which is mounted on a wiring board or the like, said tool comprising:

means for detachably mounting said tool on said connector holder; and

an insertion assembly which reciprocates relative to said holder for moving said conductors to terminate them in said connector, said mounting means comprising locking means for locking said tool to said holder only prior to termination of said conductors in said connector whereby the operator is prevented from inadvertently removing said tool from said holder prior to termination of said conductors.

4,527,329
PROCESS FOR THE MANUFACTURE "IN SITU" OF CARBON ELECTRODES

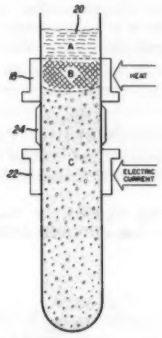
William Bruff, Vaagsbygd, Norway; Geraldo S. de Santana, and David G. de Oliveira, both of Espiritio Santo, Brazil, assignors to Carboindustrial S.A., Brazil and Elkem a/s, Norway

Continuation-in-part of Ser. No. 330,446, Dec. 14, 1981, abandoned, which is a continuation of Ser. No. 217,393, Dec. 15, 1980, abandoned, which is a continuation of Ser. No. 89,492, Oct. 30, 1979, abandoned. This application Jul. 12, 1982, Ser. No. 397,574

Claims priority, application Brazil, Oct. 31, 1978, 7807158

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—825 3 Claims



1. A process for continuously forming in situ a carbon electrode in at least one annular member and a spaced separate electrode holder for use in a smelting furnace comprising the steps of:

(a) supplying electrode paste consisting essentially of carbonaceous material and a hydrocarbon binder to said annular member;

(b) supplying heat to said electrode paste in said annular holder and controlling the supply of heat to said electrode paste in said annular member, independently of the heat of said smelting furnace, said heat being sufficient for softening and heating the electrode paste to a temperature of at least about 400° C. to bake the electrode paste and form a solid unitary carbon electrode while said electrode paste is within said annular member; and

(c) advancing the solid unitary electrode from said annular member to said holder, said spaced separate holder being operative for suspending the electrode and for receiving electrical current and supplying the current to the electrode independently of energy supplied to the annular member, whereby the solid electrode is a continuous unitary mass between said annular member and said separate holder.

4,527,330
METHOD FOR COUPLING AN ELECTRONIC DEVICE INTO AN ELECTRICAL CIRCUIT

James E. Sturm, Scottsdale, and Colleen S. Peterson, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 8, 1983, Ser. No. 520,944

Int. Cl.³ H01R *43/00*

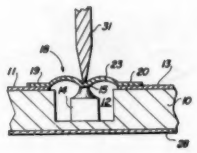
U.S. Cl. 29—827 8 Claims

1. A method of coupling an electronic device to a signal carrying conductor on a substrate comprising the steps of:

forming a lead frame from a conductive ribbon, said lead frame having at least one first portion adapted to overlie said signal carrying conductor and being approximately the same width thereas, said lead frame also having at least one second portion adapted to overlie a terminal of said electronic device, said lead frame also having at least one transition portion disposed between said first and second portions having a smoothly varying width, said lead frame also having at least one frame portion;

aligning said lead frame over said signal carrying conductor and said electronic device;

applying a bonding process to a periphery of lead frame whereby said at least one first portion is bonded to said signal carrying conductor;



applying a bonding process to said at least one second portion, whereby said at least one second portion is bonded to said terminal, said at least one transition portion forming an arc between said signal carrying conductor and said electronic device; and

trimming away said frame portion of said lead frame.

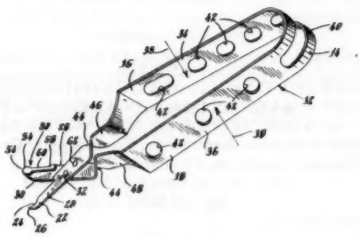
4,527,331
SUTURE REMOVER AND CONTINUOUS BAND SCISSORS

Jeffrey I. Lasner, 4 Baltusrol Dr., Purchase, N.Y. 10577, and Francisco H. Aleixo, 66 John St., Tarrytown, N.Y. 10591

Continuation-in-part of Ser. No. 342,765, Jan. 26, 1982, abandoned. This application Feb. 11, 1983, Ser. No. 465,873

Int. Cl.³ B26B *13/16*

U.S. Cl. 30—135 14 Claims

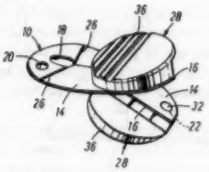


13. A scissors comprising an elongated strip of yieldable and flexible material, said strip being bent substantially midway along its length forming gripping sections and first and second shanks which are disposed in substantially spaced apart relationship, said first shanks having a cutting blade at its end remote from said bend, and said second shank having a shear blade at its end remote from said bend, each of said shanks being twisted in the same direction approximately 90° whereby said cutting blade and shear blade as well as the first and second shanks are oriented in substantially overlying parallel planes which results in maximum opening of the blade tips, means pivotally connecting said blades for movement toward and away from each other along a cutting plane for shearing contact with the material to be cut, said blades being yieldable to urge the same towards each other thereby forming a set with a substantially 0° clearance for effective material cutting, and each of said shanks having a space confronting portion which is in a plane that is substantially perpendicular to the plane of said blades and which forms a stop with the other portion against further movement of said blades when said gripping sections are squeezed toward each other.

4,527,332
HANDY SCISSORS

Takaaki Aoki, 8-D-329, 2-Chome, Nakatsu, Ohyodo-Ku, Osaka-Shi, Osaka-Fu, Japan

Filed Nov. 23, 1983, Ser. No. 554,499
Claims priority, application Japan, Nov. 30, 1982, 57-182005[U]; Jun. 23, 1983, 58-97715[U]
Int. Cl.³ B26B *13/08, 13/10*
U.S. Cl. 30—234 **5 Claims**

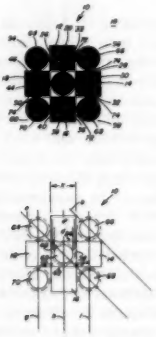


1. A pair of handy scissors comprising a plate body having an eliptical hole, a parting line projected from a margin of said hole to a margin of said plate body, said parting line being cut at an angle other than a perpendicular angle to said plate body so as to form an acute and an obtuse angle on each side of the plate body, two blade portions defined by said parting line and the margins of said plate body, said blade portions each being bent in an arc in opposite directions away from the plane of the plate from a line projecting from said eliptical hole to form a crease at an oblique angle to said parting line, said bends being formed such that the acute angles formed between the surface of each blade half and the parting line are disposed toward the plane of the plate body and two operating levers attached to said blade halves on the inner surfaces of the arcuate blade halves, said levers having surfaces whereby pressure may be applied at an angle to said blade portion surfaces and being relieved on the side facing the opposing blade portion so as to receive said opposite blade portion when the blades are forced to pass each other.

4,527,333
DEVICE FOR INDICATING A QUANTITATIVE CHANGE IN DOT AREA OF AN IMAGE IN A PRINTING PROCESS AND THE METHOD OF MAKING THE SAME

Richard D. Warner, Burgettstown, Pa., assignor to Graphic Arts Technical Foundation, Pittsburgh, Pa.

Filed Jan. 23, 1984, Ser. No. 572,930
Int. Cl.³ G01B *3/00*
U.S. Cl. 33—1 B **11 Claims**



1. A device for indicating a quantitative change in dot area of an image in a printing process comprising,

four square members positioned on a substrate,

each of said square members having four intersecting sides to form four corners for each square,

each of said square members being substantially equal in size with each side of a preselected dimension,

each of said square members having one corner in juxtaposition with a corner from another square member to form a square center opening bounded by a side from each of said square members and four corner openings defined by sides of adjacent squares,

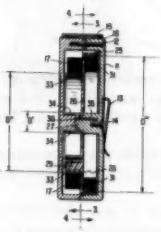
at least one shaped member positioned in one of said openings on said substrate in spaced relation to an adjacent side of said square, and

said shaped member spaced from at least one of said adjacent sides of said squares a preselected distance and forming a gap therebetween so that an increase in area of said squares and said shaped member to the extent that said shaped member is in juxtaposition with said side of said square being indicative of a predetermined change in dot area.

4,527,334
POWER RETURN TAPE

Herman S. Jones, Wendell, and William C. Blackman, Raleigh, both of N.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 30, 1983, Ser. No. 537,518
Int. Cl.³ G01B *3/10*
U.S. Cl. 33—138 **10 Claims**



5. A measuring device including a casing having a central hub, a drum having a plurality of rims mounted on the hub, a tape being wound onto one of said rims, and a return spring being wound inside another of said rims, said tape being mounted on one side of the drum, and said spring being mounted on an opposite side of the drum.

7. A measuring device comprising a casing, a drum mounted within the casing, a return spring mounted on said drum and a tape mounted on said drum in side-by-side relationship with the return spring, said drum comprising a flat central disc and a plurality of rims concentrically mounted on said disc.

4,527,335
AVERAGING AXIAL-DIAMETRAL STRAIN MEASURING EXTENSOMETER

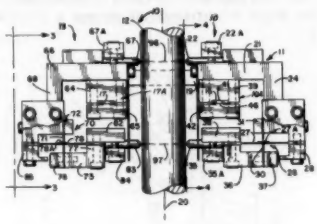
Harry R. Meline, Minnetonka, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jul. 29, 1983, Ser. No. 518,379
Int. Cl.³ G01B *7/16;* **G01N** *19/06*
U.S. Cl. 33—147 D **16 Claims**

1. In an extensometer assembly comprising first and second extensometer sections, said extensometer sections each having means for measuring changes in length along a longitudinal measuring axis of a specimen the improvement comprising:

a support system for supporting the extensometer sections relative to each other on substantially opposite sides of a specimen comprising first and second extensometer support means, each connected to a different one of the extensometer sections, said support means flexing easily about

axes perpendicular to the axis of a specimen with which the extensometer sections are used and resisting bending about axes parallel to the longitudinal axis of such specimen; and



alignment beam means extending across the specimen for coupling said first and second support means to each other, said alignment beam means permitting resilient bending about an axis generally parallel to the axis of a specimen with which the extensometer sections are used, and resisting substantial movement about other axes.

4,527,336

DISPLACEMENT MEASURING INSTRUMENT

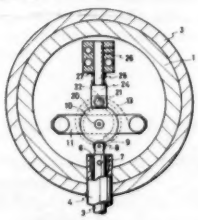
Ichiro Mizuno, and Iwao Sugizaki, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,833

Claims priority, application Japan, Jul. 2, 1982, 57-115661; Jul. 2, 1982, 57-115662

Int. Cl.³ G01B *3/22*

U.S. Cl. 33—172 R **9 Claims**



1. A displacement measuring instrument, comprising:

a case body;

a movable member displaceably secured to said case body and capable of abutting at one end thereof against a workpiece to be measured, said movable member having a rotatably supported roller on the other end thereof;

a rotatable shaft mounted on said case body;

a cam supported on said shaft and rotatable therewith, said cam having an Archimedean spiral surface at the periphery thereof, against which said roller is rotatably engaged;

a rotator secured to said shaft and being concentrically oriented with said cam;

a rotatable follower member engageable with said rotator, said cam, said rotator and said follower member being arranged such that said follower member makes two or more revolutions per one revolution of said cam; and

indicating means for indicating a displacement value of said movable member in response to a rotation of said follower member.

4,527,337

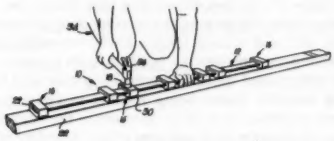
FRAMING STUD TEMPLATE

Cletus F. Dreiling, Box 38, Rte. 2, Herrells' Trailer Park, Garden City, Kans. 67846

Filed Mar. 21, 1983, Ser. No. 476,998

Int. Cl.³ G01B *3/30, 5/14*

U.S. Cl. 33—562 **6 Claims**



1. A carpenter's template for repetitively laying a series of studding locations along the stringers of the wall framing of a building, said template comprising:

an elongated support; and

a plurality of spaced, solid blocks mounted on said support,

each block having a pair of flat, parallel sides, a pair of flat, parallel ends, a flat top normal to the sides and the ends, a flat bottom parallel to the top and a pair of spaced, solid, elongated cutters integral with the block, each cutter having a length at least equal to the width of the studding, and equal to the lengths of said sides,

each cutter being chisel-like and extending downwardly from the bottom such that a lower recess is formed in each block bounded by said cutters and said bottom,

each cutter converging downwardly to an elongated cutting edge,

said edges being spaced substantially equal to the thickness of the studding, whereby the cutters scribe the stringers in response to light tapping hammer blows directly struck on the tops of the blocks.

4,527,338

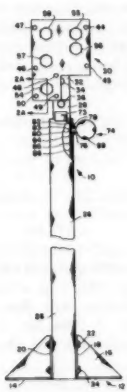
DEVICE FOR INSTALLING AN ARTICLE ON A VERTICAL SURFACE

John Dickinson, 8400 Flame Vine Ave. North, Seminole, Fla. 33543, and Peter Warhurst, 1894 Del Robles Dr., Clearwater, Fla. 33546

Filed Feb. 22, 1984, Ser. No. 582,387

Int. Cl.³ B25H *7/00*

U.S. Cl. 33—180 R **23 Claims**



1. A device for installing an article on a vertical surface, said device comprising:

a base;

a first longitudinal member connected to said base;
a second longitudinal member slidable longitudinally relative said first member;
means for establishing said second longitudinal member in a telescopic relationship with said first longitudinal member enabling the distal end of said second longitudinal member to be varied in vertical height relative said base;
a template frame secured to said second member;
a plurality of punches disposed in said frame; and
locking means for locking the relative position between said first and said second longitudinally-extending members, enabling an operator to position said template frame a pre-determined distance vertically above said base with said template frame being located in contact with the vertical surface to form an aperture in the vertical surface upon depression of at least one of said plurality of punches to install the article on the vertical surface thereby.

4,527,339

THREE DIMENSION TARGET

Amber N. Brunson, Independence, Mo., assignor to Brunson Instrument Company, Kansas City, Mo.

Filed Feb. 21, 1984, Ser. No. 581,870
Int. Cl.³ G01C *15/02*
U.S. Cl. 33—293 **14 Claims**

1. A three dimension target for optical tooling comprising:
(a) a target head including a first target for sighting by optical tooling instruments;
(b) an extension rod having one end with means for connection to said target head and a second end including means for positioning said rod upon a construction site not readily viewable by said optical tooling instruments;
(i) said first target being positioned substantially on a line coaxial with a longitudinal axis of rotation of said extension rod; and
(c) means for supporting said extension rod and target head in extension from said construction site whereby said target head is positioned in lines of sight of said optical tooling instruments.

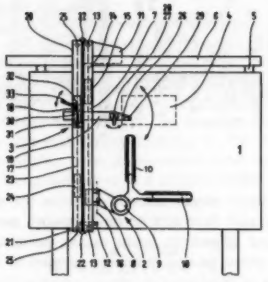
4,527,340

HOLDING AND GUIDING DEVICE FOR TRAVELING-CARRIAGE DRAFTING MACHINES

Gert Heups, Schwanau, Fed. Rep. of Germany, assignor to Albert Nestler GmbH, Lahr, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,193
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312853
Int. Cl.³ B43L *13/02*
U.S. Cl. 33—430 **15 Claims**

1. A holding and guiding device for lettering and drafting instruments adapted to be mounted on a traveling-carriage drafting machine having a vertical slide rail and a laterally extending angle-adjusting head means for carrying drafting rods slidably mounted on the slide rail, the holding and guiding device comprising an additional slide rail, means for detachably securing the additional slide rail to said vertical slide rail, said additional slide rail being disposed in parallel to the vertical slide rail and disposed on a side opposite the vertical slide rail to the angle adjusting head means, a traveling-carriage



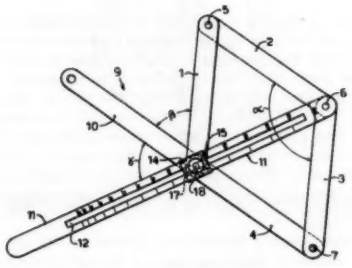
means mounted on said additional slide rail, a substantially flat instrument holder means mounted to said traveling carriage means so as to extend below said additional slide rail in a direction of the angle adjusting head means, and means provided at the end of the instrument holder means for accommodating the lettering and drafting instruments.

4,527,341

ANGLE DETERMINATOR OF PARALLELOGRAM TYPE

Lennart Schön, 12 Posthemsvägen, S-575 00 Eksjö , Sweden

Filed Oct. 2, 1984, Ser. No. 656,874
Claims priority, application Sweden, Oct. 6, 1983, 8305505
Int. Cl.³ B43L *7/06*
U.S. Cl. 33—455 **4 Claims**

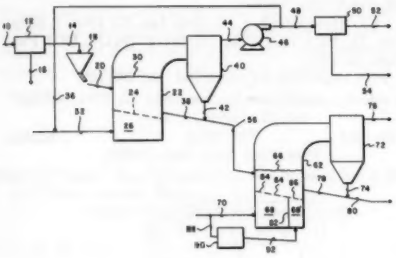


1. An angle determinator comprising four hingedly interconnected links, said links forming together a parallelogram having corners or apexes constructed as pivot joints, a bar-like member turnably connected to said parallelogram at a first one of its apexes, at least one scale provided on and extending along part of said bar-like member, and a pointer or index provided at that one of the apexes of the parallelogram which is opposite to said first apex, said pointer cooperating with said scale and being displaceable along the scale together with said opposite apex of the parallelogram, wherein one of the links forming the angle of the parallelogram at said opposite apex constitutes an integral portion of a substantially straight rod-like member forming together with said bar an angle which is half as wide as the angle of the parallelogram at said first apex.

4,527,342
PROCESS FOR COOLING PARTICULATE SOLIDS

Ying H. Li, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 2, 1984, Ser. No. 596,213
Int. Cl.[3] F26B *3/08*
U.S. Cl. 34—10 7 Claims



1. In a process for cooling particulate solids to a selected temperature in a fluidized bed, said fluidized bed being maintained above a support means in a cooling vessel by flowing cooling gas upwardly through said fluidized bed at a rate sufficient to maintain said fluidized bed in a fluidized state and cool said particulate solids, the improvement comprising:

(a) positioning a partition beneath said support means to form a first cooling gas distribution chamber beneath a first portion of said support means and a second gas distribution chamber beneath said second portion of said support means when the temperature of the cooling gas is near said selected temperature;

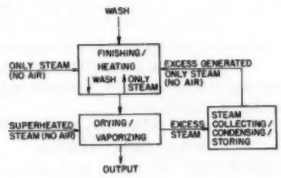
(b) flowing said cooling gas through said particulate solids above said first portion of said support means; and

(c) flowing a cooled cooling gas at a temperature at least 10° F. cooler than said cooling gas through said solids above a second portion of said support means, said second portion of said support means being adjacent the particulate solids discharge thereby increasing the cooling capacity of said fluidized bed.

4,527,343
PROCESS FOR THE FINISHING AND/OR DRYING OF WASH

Jorg Danneberg, Mathildenstrasse 42, D-8500 Nuremberg 20, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,236
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1982, 3230764
Int. Cl.[3] F26B *5/04, 3/00;* B08B *3/12*
U.S. Cl. 34—16 17 Claims

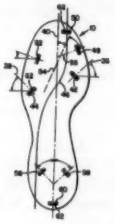


1. A process for the smooth finishing or the smooth finishing and drying of wash through the utilization of only steam as an energy carrier medium, comprising heating and smoothing the wash with an energy carrier comprising substantially only steam, without air, partially condensing said steam to heated water which penetrates the wash to ensure a rapid heat penetration to the interior weaves of the wash and rapid heating of the wash by the steam, whereby the lack of oxygen in the steam avoids singeing of the wash.

4,527,344
CLEATED SHOES

John D. Mozena, 14385 SW. Walker Rd., #B9, Beaverton, Oreg. 97006

Filed May 17, 1983, Ser. No. 495,268
Int. Cl.[3] A43B *5/00*
U.S. Cl. 36—126 7 Claims



1. A cleated shoe adapted to provide traction for a wearer on a turflike substrate when movement is generated through a broad range of angular directions including forward movement as determined by the center line of the shoe which extends from the heel of the shoe forwardly to the toe thereof, comprising; said shoe having a substrate engaging shoe bottom, a forefoot portion of the shoe bottom adapted to cover the bottom of the forefoot of the wearer and a heel portion adapted to cover the bottom of the rearfoot of the wearer, said forefoot portion having a first designated position for support of the first metatarsal head of the wearer's foot, and a second designated position for support of the fifth metatarsal head of the wearer's foot, a first bladelike cleat having opposed broad faces affixed to the shoe bottom at said first position and a second bladelike cleat having opposed broad faces affixed to the shoe bottom at said second position, said first cleat oriented relative to the center line whereby a line (**26**) perpendicular to the broad faces of the cleat is forwardly projected from the center line in an angular range of about 40° to 70° relative to the center line, and said second cleat is oriented to the center line whereby a line (**28**) perpendicular to the broad faces of the cleat is forwardly projected from the center line in an angular range of about 20° to 50° relative to the center line.

4,527,345
SOLES FOR SPORT SHOES

Julio Lopez Lopez, Castellon de la Plana, Spain, assignor to Griplite, S.L., Spain

Filed Jun. 7, 1983, Ser. No. 502,005
Claims priority, application Spain, Jun. 9, 1982, 265758; Jun. 18, 1982, 265954
Int. Cl.[3] A43B *5/00, 13/04, 5/06*
U.S. Cl. 36—127 7 Claims

1. A set of soles for a left and right pair of sport shoes comprising means defining a dividing line extending from the toe to the heel dividing each sole into inner and outer sole portions, the inner sole portion of one of said soles being a substantially smooth surface having a plurality of shallow recesses therin and the outer sole portion of said one sole having a plurality of stud-like projections, the inner sole portion of the other of said soles having a pluality of stud-like projections and the outer

sole portion of said other sole being a substantially smooth surface hajving a plurality of shallow recesses, said recesses

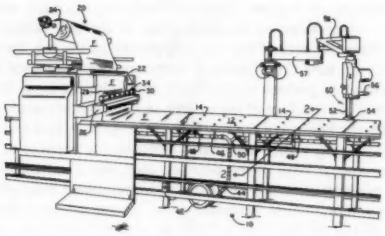
being of substantially smaller depth than said stud-like projections.

4,527,346

SHEET MATERIAL STACKING, CONVEYING AND CUTTING METHOD AND APPARATUS

John M. Schwartzott, Greensboro, N.C., assignor to Macpherson, Inc., Greensboro, N.C.

Filed Sep. 14, 1983, Ser. No. 531,882
Int. Cl.³ D06C *3/00*
U.S. Cl. 38—144 **12 Claims**



1. An apparatus for facilitating the handling of goods or materials during processes such as cutting, sewing, binding, stacking and the like where the goods or materials are conveyed from one work station to another work station by means of a cushion of air, and then held in place at a selected work station by application of air suction, said apparatus comprising:

(a) a work table having a top with a flat, substantially smooth upper surface on which the goods are processed;

(b) a plurality of apertures arranged in spaced relationship to each other in a selected pattern covering a substantial portion of said top, and extending through said top for passage of air currents therethrough;

(c) means for generating and delivering said air currents to said apertures, said means comprising an air current generator and a plurality of conduits operatively connected thereto, each one of said conduits being separately connected to one of said apertures and collectively connected by means of a header having a substantially lesser volume than the volume of said table bounded by said apertures to said generating source for delivering air from said generator to said apertures;

(d) means for relatively instantaneously reversing said air current from a positive flow pressure to a negative flow pressure;

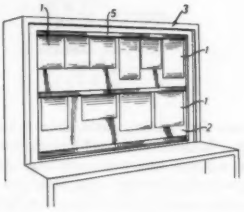
whereby the substantially lesser header volume allows for the relatively instantaneously application of said reversing air current such that the goods on which work is being performed are subjected to the selective and instantaneous application of a positive pressure air current for forming said cushion of air to convey the goods, or to a negative pressure air current for applying suction pressure to hold the goods in place; thus eliminating the necessity of additional guides, apparatus or holding mechanisms for stabilizing the goods.

4,527,347

FIXING MEANS FOR MOUNTING X-RAY FILMS

Carl E. Ohlson, Solna, Sweden, assignor to AO Medical Products AB, Stockholm, Sweden

PCT No. PCT/SE82/00165, § 371 Date Jan. 12, 1983, § 102(e) Date Jan. 12, 1983, PCT Pub. No. WO82/04130, PCT Pub. Date Nov. 25, 1982
PCT Filed May 11, 1982, Ser. No. 459,605
Claims priority, application Sweden, May 12, 1981, 8102987
Int. Cl.³ G09F *13/00*
U.S. Cl. 40—361 **7 Claims**



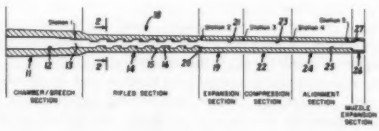
1. A fixing means for mounting X-ray films, or like elements, to an illuminated surface of an X-ray examining cabinet in a readily suitable manner, the fixing means comprising: an illuminated surface; a profiled frame element extending along said surface; a resilient member made of resilient material and having an anchoring portion received in the profiled frame element; a film-engaging portion including a pointed part which is arranged to be deflected when an X-ray film is introduced between said surface and said film-engaging portion and to hold said film against said illuminated surface by friction, the engaging portion supported so that it forms substantially a right angle with the anchoring portion; hinge means connecting the anchoring portion and the engaging portion to facilitate deflection of the engaging portion when the film is mounted, said hinge means being of reduced thickness relative to said anchoring portion and said film-engaging portion and including a rounded, smooth briding portion between the anchoring portion and the engaging portion; the distance between fhe illuminated surface and the surface of the profiled frame element abutting the anchoring portion being such that when the engaging portion swings back under the frictional engagement of its pointed part against the X-ray film the engaging portion is deflected away from said illuminated surface, resulting in an increase in the elastic abutment pressure exerted against the X-ray film.

4,527,348

GUN BARREL

Dean C. Brennan, Whitefish, Mont., assignor to D. C. Brennan Firearms, Inc., Kalispell, Mont.

Filed Jan. 27, 1984, Ser. No. 574,658
Int. Cl.³ F41C *21/00*
U.S. Cl. 42—76 R **10 Claims**



8. A method of providing decreased felt recoil and increased

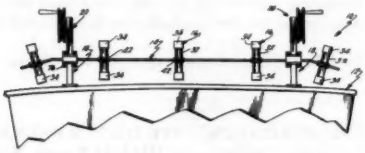
velocity when firing a bullet through a gun barrel comprising the steps of burning a propellant to provide expanding gases to propel the bullet through a rifled section of the barrel, permitting propellant gases to expand past the bullet in the rifled section and a smoothbore section of the barrel to reduce peak gas pressure in the barrel thus affording safer gun firing, the amount of gases expanding past the bullet being sufficient to provide relatively low gas pressure adjacent the muzzle at the time of bullet exit compared to the gas pressure adjacent the muzzle in a conventional gun barrel, the low gas pressure reducing bullet deformation and muzzle blast, whereby bullet accuracy is increased and felt recoil is reduced.

4,527,349

TROLLING BAR ASSEMBLY

John E. Emory, Jr., Traverse City, Mich., assignor to Big Jon, Inc., Traverse City, Mich.

Filed Feb. 9, 1983, Ser. No. 465,194
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—21.2 **3 Claims**



1. A support assembly attachable to the stern of a boat and adapted to support a plurality of fishing rod holders, said support assembly comprising:

an elongated, generally planar member, said member defining a plurality of rod holder apertures; and

a pair of adjustably positionable mounting brackets for mounting the elongated member to a boat, said brackets each including:

a base plate;

a support post secured to said base plate; and

channel means secured to said support post opposite said base plate for slidably receiving said elongated member, said channel means comprising:

a top plate having a central planar portion with lateral flanges defining recesses at each side thereof;

a bracket member including a top, central, planar wall with L-shaped depending side flanges defining a channel between said wall and each of the lower legs of said L-shaped flanges for receiving the elongated planar member, said lower legs being seated in the said recesses of said top plate; and

means engaging said lateral flanges of said top plate for securing said bracket member to said top plate for clamping said elongated member disposed inbetween said top plate and bracket member.

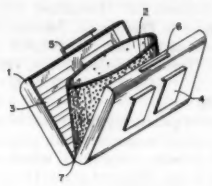
4,527,350

WORM CARRIERS

Darwin R. Tockey, Jr., Rte. 2, Box 153, Bishop, Calif. 93514

Filed Jun. 13, 1983, Ser. No. 503,763
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—55 **1 Claim**

1. A portable evaporation cooled worm carrier comprising a main housing of light-weight durable rigid plastic material having ventilation slots, said housing including clip means for attachment to the clothing of a user at a position convenient for access with one hand, said housing being hingedly separable and containing a removable bait pouch, said pouch being moisture-absorbent and made of a flexible, resilient, porous, and non-toxic material which enables worms to remain cool and



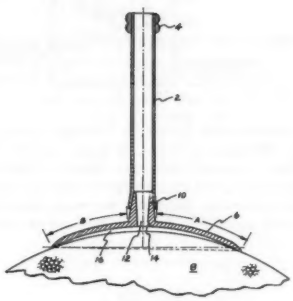
healthy for extended periods of time without the use of bedding materials.

4,527,351

LEVITATED BALL TOY

Peter K. Gerakiteys, P.O. Box 463, Newcastle, N.S.W. 2300, Australia

PCT No. PCT/AU81/00034, § 371 Date Nov. 25, 1981, § 102(e) Date Nov. 25, 1981, PCT Pub. No. WO81/02680, PCT Pub. Date Oct. 1, 1981
PCT Filed Mar. 25, 1981, Ser. No. 328,586
Int. Cl.³ A63H *29/16*
U.S. Cl. 446—202 **6 Claims**



1. A toy comprising a very light ball and a tube, one end of said tube being intended for apposition to the lips for directing a stream of air through the tube toward a cup fixed to the opposite end of the tube, said cup having a concave surface which approximately mates with the surface of the ball and which extends over less than half of the surface of the ball such that when the ball is placed beneath the cup, then offered up to the cup and the ball contacts the lip of the cup, there is a clearance between the ball and the curved surface of the cup, which clearance is greater at the center of the cup, and then a steady stream of air is expressed from the cup, the ball is trapped by the airstream and remains in close proximity to the cup, wherein the tube is connected to the cup at the center of the cup and air is admitted from the tube to the cup by a central port which is relieved or chamfered in one sector in order to bias the escaping air in one direction which causes the supported ball to spin.

4,527,352

FULL DWARF HYBRID SUNFLOWER SEED AND PLANT AND METHOD OF PRODUCING HYBRID SEED

Freeman K. Johnson, 731 Homestead Ave., Moorhead, Minn. 56560, assignor to Freeman K. Johnson, Moorhead, Minn.

Continuation-in-part of Ser. No. 295,363, Aug. 24, 1981, Pat. No. 4,378,655. This application Oct. 6, 1982, Ser. No. 433,091

Int. Cl.³ A01H *1/02*

U.S. Cl. 47—58 **22 Claims**

1. A method of producing full-dwarf hybrid sunflower seeds which will produce sunflowers with reduced internode length under normal growing conditions, which comprises:

(a) growing a pair of parent plants (P_1 and P_2) wherein in at least one parent substantially all pollen is nonfunctional and at least one parent has gametes with nuclei which carry at least one dominant gene for reduced internode length (Dr);

(b) cross pollinating the plants (P_1 and P_2) to produce hybrid seeds F_1; and

(c) harvesting the hybrid seeds.

4,527,353

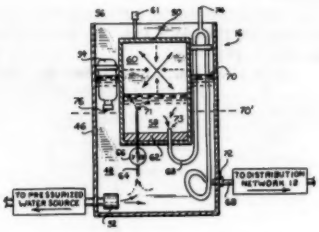
IRRIGATION/FERTILIZATION CONTROL AND DISTRIBUTION SYSTEM

John C. Newby, 41289 Malcolmson St., Fremont, Calif. 94538

Filed Apr. 4, 1983, Ser. No. 481,817

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—59 **17 Claims**



14. In a fertilization system, a fertilizer metering device comprising a fertilizer reservoir at least partially filled with liquid fertilizer, a sealed metering chamber floating in said fertilizer reservoir, a first conduit permitting fluid to flow from said fertilizer reservoir into said metering chamber, and a second conduit permitting fluid to flow out of said metering chamber.

4,527,354

IMPLANTABLE RESERVOIR FOR AUTOMATIC WATERING OF PLANTS

Michel Sellier, 3058 M St., NW., Washington, D.C. 20007

Filed Aug. 5, 1983, Ser. No. 520,541

Int. Cl.³ A01G *27/00*

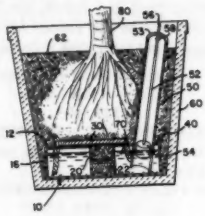
U.S. Cl. 47—81 **9 Claims**

1. A soil-implantable reservoir for implantation in the soil of a soil container which hosts a plant comprising:

implantable means having a top surface, a bottom surface, and side wall means for interconnectng said top and bottom surfaces for defining a chamber therein for storing fluids, said top surface and bottom surface being formed of a thin material and said top surface including a filling orifice and at least one fluid supply orifice;

support means integrally formed with said implantable means for providing support for the weight of the soil when implanted in said soil container, said support means comprising at least one pair of opposed insets disposed in the respective top and bottom surfaces of the implantable means wherein said opposed insets substantially abut against each other thereby to maintain separation between the respective top and bottom surfaces under the weight of the soil when implanted;

said implantable means and said support means being constituted by a thin plastic material formed together in a unitary structure by a blown film process to enable said insets to be formed as contoured surfaces for supporting said reservoir;



capillary means extending through said fluid supply orifice and contacting said soil for drawing fluids from said implantable means and for supplying the fluids to said soil; and

means for filling said implantable reservoir with fluids.

4,527,355

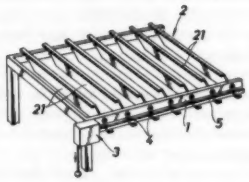
OPENING AND CLOSING TYPE LOUVER DEVICE

Hajime Numakami, Chigasaki, and Hideyuki Kuroda, Kamakura, both of Japan, assignors to Zeon Kasei Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,522

Int. Cl.³ E05F *17/00*; **E06B** *7/086*

U.S. Cl. 49—82 **2 Claims**



1. An opening and closing type louver device comprising a louver in which a number of blades are arranged in a row in a required spaced relation on rotating shafts within a frame, each blade being opened and closed by a driving mechanism while maintaining their parallel relation, said device comprising a blade in which blade members provided with alternate upper and lower engaging side edge plates at ends thereof parallel to a hollow shaft are integrally provided on opposite sides of the hollow shaft having a polygon in section, a rotating shaft comprising two members, one for an idle shaft having pillar portions of the same sectional shape fittable in said hollow shaft and the other for a driving shaft, each of said pillar portions having a polygon cross-section projectingly provided with a plurality of raised strips in contact with inner corners of the hollow shaft, a driving arm mounted on a free end of the driving shaft of each of said blades and a reciprocating rod connected to said driving arms, a ratchet gearing secured to the side of said frame, and a length-adjustable connecting rod interposed between said ratchet and said reciprocating rod to transmit rotation of the ratchet to the reciprocating rod, wherein said ratchet gearing comprises a shaft of a base plate secured to the frame side, a driving lever having a ratchet pivotally mounted on said shaft and a ratchet feed pawl, and a spring member encircling the shaft for always biasing said driving lever, and an anti-slip mechanism is provided which

comprises a small diameter gear having the same number of teeth as that of said ratchet and integrally provided on the side of the ratchet with said teeth directed reversely to the ratchet teeth, stopper pawl rotatably mounted on required portions of said base plate to engage said locking gear, and a stopper level in engagement with a projection provided projectingly on the driving level to release engagement between the locking gear and the stopper pawl as said driving lever moves.

4,527,356

CAM GRINDING MACHINE

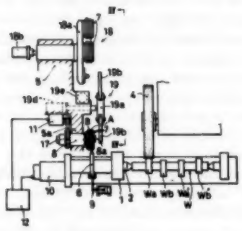
Takashi Ozone, Kodaira; Shohei Hayakawa, Hidaka; Fusao Nakajima, Sayama; Keiichi Yamada, Hidaka, and Kazuo Araki, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 517,036

Claims priority, application Japan, Jul. 23, 1982, 57-127568; Oct. 6, 1982, 57-174662

Int. Cl.³ B24B *17/02*

U.S. Cl. 51—101 R **4 Claims**



1. A cam grinding machine including a machine frame, a turning grinding wheel adjacent the frame, a swingable table positioned opposite to the frame, a turnable work shaft for holding a workpiece mounted on said table, the table being arranged to be controlled in its swing movement by a touch roller means and a master cam means which are disposed to face one another between the table and the machine frame so that the workpiece may be ground by the turning grinding wheel which is provided on the forward side in the forward and rearward swing direction of the table, characterized in that the touch roller means is provided on the table, the master cam means is provided on the machine frame, and a driving shaft for the master cam means is adapted to be turnable synchronously with turning of the work shaft also to be adjustable in its turning phase in relation to the work shaft, said master cam means being mounted on a free end portion of the driving shaft that projects outwards from a bearing portion thereof so as to be detachable therefrom in its axial direction, a stock means for other master cam means is provided on one side of the driving shaft so that the other master cam means on the stock means and the master cam means on the driving shaft are replaceable one with another through an intermediate replacement means.

4,527,357

INTERNAL GRINDING MACHINE

William E. Shank, Waynesboro, Pa., assignor to Litton Industrial Products, Inc., Waynesboro, Pa.

Filed Mar. 12, 1984, Ser. No. 588,815

Int. Cl.³ B24B *19/11*

U.S. Cl. 51—105 SP **1 Claim**

1. An internal grinding machine comprising:

a work head adapted to rotate about a selected axis and to be displaced in a direction perpendicular to said axis, said work head including

a workpiece holding fixture having

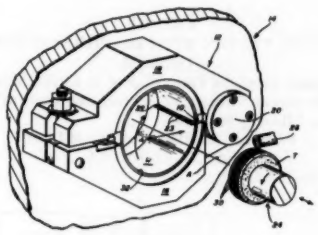
a lower fixed jaw,

an upper jaw displaceable from an open position to a closed position for clamping the outer periphery of a cylindrical workpiece having a longitudinally extending slot along the length thereof,

said fixed jaw having a longitudinally extending key to be located within the slot of the workpiece,

a grinding spindle adapted to be rotated about and displaced along its axis including

a grinding wheel having a plurality of annular, outwardly projecting tapered grinding portions for effecting stock removal from a clamped workpiece and cutting the workpiece into a selected number of annular rings, as said



grinding wheel is advanced relative to said workpiece holding fixture from a start position to a finish position,

said longitudinally extending key having slots defined therein through which said grinding portions are fed as said grinding wheel is displaced from said start position to said finish position,

said fixed jaw and said movable jaw each having a clamping surface including a plurality of annular grooves for receiving said outwardly projecting grinding portions of said grinding wheel when said workpiece holding fixture has been advanced to said finish position.

4,527,358

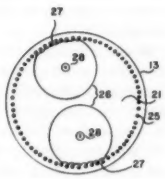
REMOVABLE POLISHING PAD ASSEMBLY

Lawrence Day, Mount Prospect, Ill., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,255

Int. Cl.³ B24B *5/00*

U.S. Cl. 51—131.3 **2 Claims**



1. A polishing pad assembly for a work piece polishing machine, comprising;

(a) a polishing platen rotatable about a vertical axis through a horizontal plane,

(b) a polishing pad carrier disc removably mounted upon one exposed surface of said platen,

(c) a polishing pad releasably attached to one surface of said carrier disc and providing an exposed polishing face for engagement with a work piece to be polished,

(d) a set of work piece holder plates freely positioned in facial abutment upon said exposed polishing face of said polishing pad,

(e) a series of holding pins extending perpendicularly from said one exposed surface of said platen in a circular pattern about the periphery thereof, and a series of openings

formed in a like circular pattern in said polishing pad carrier disc and into which said pins project for releasably mounting said polishing pad carrier disc onto said one exposed surface of said platen for rotation therewith through a horizontal plane, and

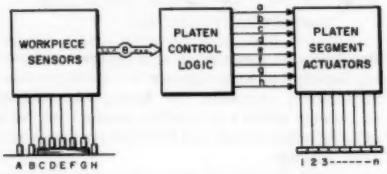
(f) a series of gear like teeth formed on the periphery of each of said work piece holder plates for engaging said holding pins as they project through said openings formed in said polishing pad carrier disc, rotating said work piece holder plate about their vertical axis as said platen rotates about its axis through a horizontal plane.

4,527,359

SEGMENTED PLATEN WITH DIAPHRAGM CYLINDER CONTROL

Lee E. Stump, Brooklyn Park; Eugene C. David, Minneapolis, and Dale Boehne, Cologne, all of Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Filed Apr. 23, 1984, Ser. No. 602,920
Int. Cl.³ B24B *21/08*
U.S. Cl. 51—138 **4 Claims**



1. In a sanding and polishing machine for individual workpieces and having a frame, infeed conveyor means arranged thereon for conveying workpieces along a predetermined path, endless abrasive belt means coupled to the frame and defining a working station disposed along said path and including an endless abrasive belt, means driving said belt, belt guide means, and segmented platen means for adjustably positioning said belt guide means relative to said predetermined path, the improvement comprising:

(a) said adjustable positioning means comprising a plurality of vertically movable plunger means for adjustably positioning individual segments of said segmented platen means to define the composite configuration of said segmented platen means;

(b) control means for controllably actuating selected ones of said plurality of vertically movable plunger means;

(c) sensing means normally disposed above said conveyor means for sensing the width, in a direction transverse to the feed path, of individual workpieces moving along said conveyor means and for creating a product presence signal responsive to the sensed condition of a workpiece being present therebeneath;

(d) signal processing means having a first input responsive to the signal created by said sensing means to actuate said control means so as to actuate a selected number of said plurality of plunger means corresponding to the sensed width of the individual workpieces; and

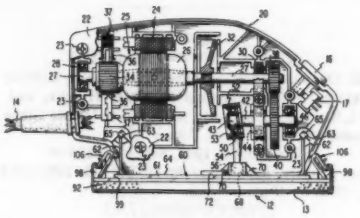
(e) said signal processing means further having and a second input, said second input associated with said signal processing means to create an output signal in addition to said product presence signal for selectively actuating a predetermined number of said plurality of vertically movable plunger means in addition to those actuated by said product presence signal and disposed adjacent thereto for controllably positioning said segmented platen means relative to said infeed conveyor means so that the actuated segments of the platen extend beyond the width of the individual workpieces.

4,527,360

ACTUATOR FOR IN-LINE SANDER

William C. Dicke, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 25, 1983, Ser. No. 555,326
Int. Cl.³ B24B *23/04*
U.S. Cl. 51—170 TL **3 Claims**



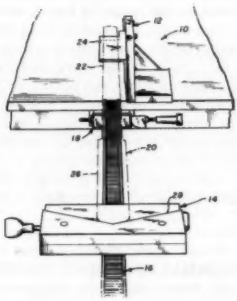
1. In an in-line motion sander having a housing, a platen support carried by said housing, a platen having a surface for supporting an abrasive sheet, means for attaching said platen to said platen support, and an actuating device for influencing motion of said platen support, in which said platen support is carried by said housing by a plurality of legs extending therebetween, said legs being arranged in spaced relation and adjacent the extremities of said platen support with each said leg being shaped to provide flexibility in the direction of said in-line motion and rigidity in a direction transverse thereto, in which said actuating device comprises a rotating electric motor and a platen motion influencing means driven by said motor both of which are arranged in said housing vertically above said platen and between said platen support carrying legs, and in which said motion influencing means is operatively connected to said platen support at a location generally centrally between said platen support carrying legs.

4,527,361

SHARPENER FOR TURNING TOOLS

Herbert O. Bergdahl, Jr., R.F.D., Falls Village, Conn. 06031

Filed Dec. 2, 1982, Ser. No. 446,348
Int. Cl.³ B24B *41/06*
U.S. Cl. 51—239 **11 Claims**



1. Apparatus for supporting a cutting tool during the sharpening thereof, the tool having an elongated handle at a first and thereof and an elongated blade with a cutting edge at the other end thereof extending from the handle, said support apparatus being intended for use in combination with a grinding wheel which rotates about a stationary axis and comprising:

tool blade support means, said blade support means including a base portion which defines a plane, said blade support means further including a blade support platform,

said platform intended to be juxtapositioned to a grinding wheel, said platform defining a plane and being rotatable about an axis which is parallel to the axis of rotation of the grinding wheel, said base portion defined plane being transverse to a plane which is transverse to said axes, the blade of a tool to be sharpened being positioned on said blade support platform with the cutting edge thereof extending beyond a first side edge of said platform during sharpening whereby a portion of the blade adjacent to the cutting edge to be sharpened is positively supported from below during sharpening;

tool handle support means, said handle support means defining an open sided tool handle receiving guide groove, the handle of a tool having its blade on said support means platform; resting on said handle support means and being movable along said guide groove during sharpening whereby said guide groove may determine a contour of the tool blade cutting edge;

means for adjusting the spacing between said handle support means and said blade support means; and

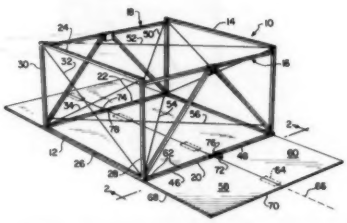
means for varying the angular orientation of said spacing adjusting means whereby the spacing of said handle support means relative to the plane defined by said blade support means base portion may be adjusted, said angular orientation varying means being spacially displaced from the axis of rotation of said blade support means axis.

4,527,362

DEPLOYABLE TRUSS

William H. Tobey, Littleton; John V. Coyner, Conifer, and William J. Gardner, Denver, all of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 30, 1982, Ser. No. 373,578
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—71 **20 Claims**



1. A deployable truss comprising at least one foldable module, each said module comprising:

a. two fixed frames, each of said fixed frames being generally rectangular comprising upper, lower and side members;

b. two gate assemblies extending between and pivotally connected with a side member of both of said fixed frames, each of said gate assemblies being hinged for folding near the center thereof, said fixed frames and said gate assemblies being arranged whereby when said module is in a folded configuration, said fixed frames are positioned closely adjacent each other with said gate assemblies being folded therebetween, and when said module is in a deployed configuration, said fixed frames are positioned apart a distance approximating the width of the unfolded gate assemblies; and

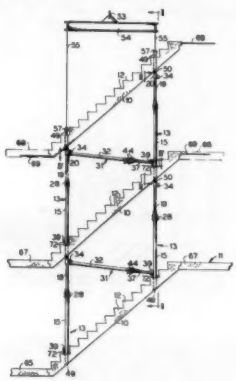
c. two base members extending between and pivotally connected with the outside of both of said fixed frames near the intersections of said lower and said side members thereof, each of said base members being foldable near the center thereof for folding in a plane parallel to the plane of said side members to which said base member is connected.

4,527,363

ERECTING PRECAST HORIZONTAL SLABS IN BUILDING CONSTRUCTION

Kolbjorn Saether, 934 Linden Ave., Wilmette, Ill. 60091

Filed Jul. 9, 1985, Ser. No. 360,797
Int. Cl.³ E04G *1/14, 25/00*
U.S. Cl. 52—122.1 **18 Claims**



1. For use in erecting preformed slabs in building construction:

a stable prefabricated temporary shoring frame assembly including a rigid generally U-shaped walkthrough base member having upstanding arms connected together at their lower ends by a transverse bar, and upwardly projecting staff means including upright extension elements with lower ends thereof connected adjustably to the upper ends of said arms;

said arms and the connected staff means providing a substantially unobstructed passageway for workmen to walk therethrough;

means for vertically adjusting said extension elements and said arms to a predetermined height relationship;

said base member adapted for temporary mounting of the lower ends of the frame assembly on a solid support;

said staff means being adapted for receiving a preformed slab raised to and placed on top of said staff means for support by said shoring frame assembly in erected position;

and means for releasably connecting said slab to said staff means for stability while the slab supported on the shoring frame assembly is being permanently attached to associated building structure;

said passageway permitting workmen to walk freely therethrough while said slab is supported on said frame assembly;

said shoring frame assembly being removable for reuse after said slab has been permanently connected to said associated building structure;

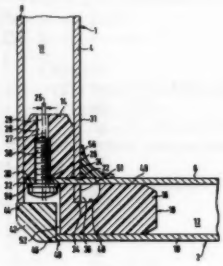
said connecting means comprising combination lifting and locating pins of greater length than the thickness of said slab, upper ends of said pins being adapted for connection to hoisting apparatus for raising the slab and for locating pin cooperation with downwardly opening sockets in the lower ends of the arms of a similar shoring frame assembly superimposed on said slab, and lower portions of said pins having lifting lug means engageable under the slab for hoisting support of the slab, and said lower portions of the pins extending below said lifting lug means and being adapted for locating cooperation within upwardly opening sockets in the upper ends of the extension elements of said slab supporting shoring frame assembly.

4,527,364

CORNER ASSEMBLY OF STRUCTURAL MEMBERS

Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed May 22, 1984, Ser. No. 613,072
Claims priority, application Fed. Rep. of Germany, May 30, 1983, 3319627
Int. Cl.[3] E04B 1/00; F16B 12/36
U.S. Cl. 52—127.7 12 Claims



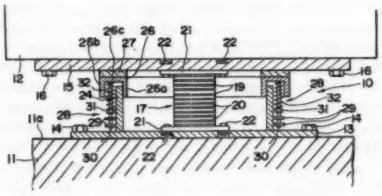
1. A corner assembly of structural members comprising: a first and a second structural member, each having an inner chamber formed by spaced inner and outer webs of said structural members, said chambers being open ended along one edge of said structural members; said structural members being disposed at an angle to define therebetween an inward corner and an outward corner; a corner connector member having a first and a second leg defining said angle therebetween and each leg snugly fitting into one of said chambers; means defining at least one first opening through said inner web of said first structural member; means defining at least one second opening through said first leg in registry with said first opening and transversely of said first leg; at least one securing projection solid with said inner web of said second structural member; means defining a third opening through said securing projection; wherein said securing projection extends through said first and second openings; means defining a fourth opening extending lengthwise of said first leg and in registry with said third opening; and locking means including a locking member passing successively through said third opening of said securing projection and through said fourth opening of said first leg, suitable to connect and secure said structural members and connector member together to form said corner assembly.

4,527,365

EARTHQUAKE INSULATING BEARING ASSEMBLY

Toshikazu Yoshizawa, Kodaira, and Takafumi Fujita, Chiba, both of Japan, assignors to Bridgestone Tire Co., Ltd., Chiba, Japan

Filed Sep. 9, 1982, Ser. No. 416,373
Claims priority, application Japan, Sep. 10, 1981, 56-142864
Int. Cl.[3] E04H 9/02; E04B 1/98
U.S. Cl. 52—67 3 Claims



1. An earthquake-insulating bearing assembly for mounting between a foundation and a building structure, said bearing assembly comprising:

(a) a first friction member fixedly secured to one of a lower surface of the building structure and an upper surface of the foundation disposed in opposed relation thereto, said first friction member being disposed horizontally;

(b) an elastic bearing interposed between and fixed relative to said lower surface of the building structure and said upper surface of the foundation, said elastic bearing comprising rubber sheets and metal sheets stacked one upon another alternately and connected together;

(c) a guide means vertically mounted on the other of said opposed lower and upper surfaces;

(d) a second friction member of an annular shape disposed around said elastic bearing, said second friction member being engaged with said guide means and movable vertically therealong; and

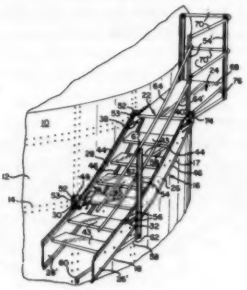
(e) spring means fixed relative to the other of said opposed lower and upper surfaces and resiliently holding said second friction member in frictional engagement with said first friction member under a selected load, said spring means comprising means for adjusting the load applied to said second friction member.

4,527,366

CURVILINEAR STAIRWAY CONSTRUCTIONS

Paul S. Greene, and David A. Greene, both of Hoopeston, Ill., assignors to Greene Welding and Hardware, Inc., East Lynn, Ill.

Filed Dec. 21, 1981, Ser. No. 332,969
Int. Cl.[3] E04F 11/00; E06C 9/00
U.S. Cl. 52—184 21 Claims



1. A prefabricated curvilinear stairway construction for mounting to curvilinear walls of differing radii of curvature comprising:

first and second stringers of a given length each comprising longitudinally extending elongate members having inner and outer planar faces and which are substantially straight over their length, but which are bendable to assume a curvature over their length which is substantially concentric to the curvature of the wall to which the stairway construction is to be mounted;

a plurality of steps having inner and outer ends;

first mounting means mounting the outer ends of said steps to said inner planar face of said stringers at locations spaced from each other and the ends of said stringers along the length of said stringers; said bendable, substantially straight given length stringers bending substantially uniformly over their length such that, together with the outer ends of said steps which are mounted thereto, the planar faces of said stringers assume a curvature which is substantially concentric to the curvature of the curvilinear wall to which the stairway construction is to be mounted when the inner ends of said steps are positioned in spaced

relationship to each other along a curve which is also substantially concentric to the curvature of the wall;

support means for supporting and fixing said inner ends of said steps in said spaced relationship along said last mentioned curve;

second mounting means for adjustably mounting either the inner or outer planar face of the upper end of one of said stringers to the other opposite planar face of the lower end of the other stringer, said mounting means permitting adjustment of the ends of the bent curved stringers relative to each other to compensate for the curvature of said stringers when mounted to each other for curvilinear walls of differing radii of curvature; and

elongate reinforcing means formed integrally with said stringers and projecting from at least one of the planar faces of said stringers along at least one edge thereof, said reinforcing means along at least one edge of one of said stringers extending into overlying relationship with one of the planar faces of the other of said stringers, but away from the other of said stringers to permit the ends of said stringers to be adjusted and mounted in flush relationship to each other.

4,527,367

SPIRAL STAIRCASE

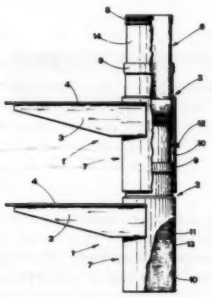
Franco Morellini, Rolo, Italy, assignor to Mobirolo S.p.A., Italy

Filed Feb. 28, 1984, Ser. No. 584,475

Claims priority, application Italy, Mar. 25, 1983, 28946/83[U]

Int. Cl.³ E04F *11/00*

U.S. Cl. 52—187 **3 Claims**



1. Spiral staircase featuring adjustable rise, characterized in that it is created by the assembly in reciprocal fashion of single modular components (1) fitted-up one on top of the next;

each said modular component (1) comprising a cylindrical section (2) to whose outer surface a step (4) or the support (3) for a step-tread (4) is fixed direct, each said cylindrical section exhibiting an upper part (6) and a lower part (7), both cylindrical in shape and coaxial one with the other;

said upper part (6) comprising an externally-threaded stretch (8) at its topmost end and a coaxially-disposed outer cylindrical stretch (9) of greater diameter set at a given distance below said threaded stretch (8) and serving to center and align said upper part for the purposes of assembly;

said lower part (7) being tubular and comprising an internally-threaded stretch (11) at its topmost end such as will mate with said externally-threaded stretch (8) offered by the topmost end of the cylindrical section (2) of another modular component (1); and an internal cylindrical stretch (10) for centering and alignment purposes located below said internally-threaded stretch (11) and designed to fit exactly over and slide back and forth axially in reciprocal fashion with the outer cylindrical newel-alignment stretch (9) offered by the upper part of the cylindrical section (2) of another modular component (1);

there being means by which to lock said modular components (1) thus assembled one to the next in the position desired.

4,527,368

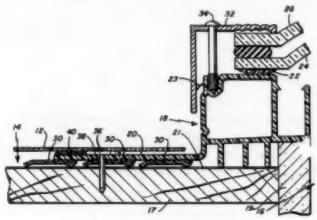
SKYLIGHT SEALING

Arthur P. Jentoft, Kennebunkport, Me., assignor to Wasco Products, Inc., Sanford, Me.

Filed Dec. 27, 1982, Ser. No. 453,339

Int. Cl.³ E04B *7/18*

U.S. Cl. 52—200 **14 Claims**



1. In a skylight apparatus for covering an opening in a building having a curb frame with a peripheral support flange extending thereabout for support of the curb frame about said opening, said flange having an underside surface, the improvement comprising; dry seal element means extending integrally from and angularly to the underside surface of said flange, said dry seal element means being flexible and adapted to bend and compress to a position substantially parallel to said flange upon securing of the curb frame flange to the building about said opening,

said dry seal element means being co-extruded with said curb frame with said dry seal element means being of a more flexible material to provide liquid tight sealing and with the curb frame flange being of a more rigid material than the dry seal element means, and securing means adapted to extend through at least said curb frame flange for compressing said dry seal element means into sealing contact about said opening.

14. A method of supporting two skylight apparatuses in close butting relationship wherein each skylight covers an opening in a building having a curb frame with a peripheral support flange extending thereabout for support of the curb frame about each respective opening, each curb frame flange having dry seal element means extending integrally from and angularly to the underside surface of said flange, said dry seal element means being flexible and being adapted to bend and compress to a position substantially parallel to said flange upon securing of the curb frame flange to the building about said opening, said method comprising the steps of placing one of said curb frames with its associated flange extending in a first direction, placing the second curb frame with its flange extending in the opposite direction and overlying the flange of the first curb frame fastening both flanges concurrently, and compressing both said curb frame flange and said dry seal element means to provide a tight seal between the curb frame flanges.

4,527,369

DOOR FRAME CLIP

George C. Adams, Ann Arbor, Mich., assignor to Rollform, Inc., Ann Arbor, Mich.

Filed Sep. 30, 1982, Ser. No. 431,822

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—211 **7 Claims**

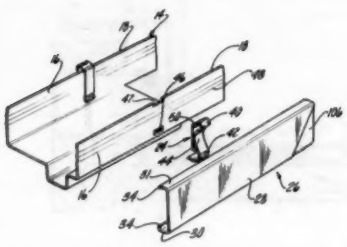
1. A fastener for attaching a facing strip to a door frame or the like, said facing strip comprising an elongated base wall and a side wall extending substantially perpendicularly outwardly from each longitudinal edge of the base wall, said base

wall and side walls together forming a channel, said fastener comprising:

a pair of oppositely facing loops, said loops spaced from each other by a distance substantially the same as the distance between said facing strip side walls so that, upon insertion of said fastener into said channel, said loops frictionally engage the facing strip side walls, and

means integrally formed with said fastener for detachably securing said fastener to the frame without deformation of said frame,

wherein said frame includes a thin walled panel having an



opening, said fastener comprising a central portion extending between said loops and abutting against one side of said thin walled panel and wherein said securing means comprises an attachment portion of said fastener extending through said opening, and

wherein said fastener comprises an attachment portion attached at one end to and extending outwardly from one loop, said attachment portion flatly abutting against the other side of said thin walled panel, and wherein said attachment portion comprises a tang formed on its other end, said thin walled panel being sandwiched in between said central and said attachment portions.

4,527,370

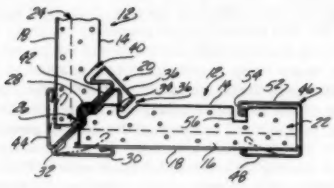
MODULAR BUILDING

Heinz Schuette, 127 Connestee Trail, Brevard, N.C. 28712

Filed Apr. 8, 1982, Ser. No. 366,834

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—282 **1 Claim**



1. A modular builiding having wall panels and roof panels formed of an insulating material; a surface of said wall panels and roof panels covered with metal sheeting; an extending edge of each panel formed into a corner joint; said corner joint cooperating with adjacent panel for joining a first upright wall and a second upright wall at a corner comprising:

the first and second upright walls abutting at a right angle at a corner along an abutting edge;

the abutting edge having a forty five degree angle;

a tongue and groove joint formed along the abutting edge;

a corner clip comprising a first leg abutting the first upright wall and extending to the corner, a first inner leg formed by bending the first leg inward abutting the abutting edge, the first inner leg passing over the tongue and groove joint in a complimentary manner, the first inner leg then being bent outward to engage the first upright wall and then being bent inward to form a first notch engaging extension, a first notch formed along the first upright wall to snugly receive the first notch engaging extension, a cross over segment formed by bending an inner end of the first notch engaging extension toward the second upright wall, a second notch engaging extension which is a mirror image of said first notch engáging extension formed by bending an end of the cross over segment toward the corner then inward, a second notch formed along said second upright to receive the second notch engaging extension, an inner end of the second notch engaging extension bent to extend outward forming a second inner leg abutting the first inner leg, an outer end of the second inner leg is then bent to form a second leg abutting second upright wall; and the first leg biased inward toward the first upright wall, the second leg biased inward toward the second wall to hold the first and second walls in abutment.

4,527,371

STRUCTURAL DAMPING

Gunnar Hagbjer, Malmö, Sweden, assignor to IFM-Akustikbyran AB, Stockholm, Sweden

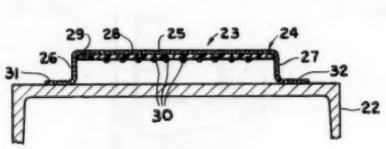
PCT No. PCT/SE82/00215, § 371 Date Feb. 14, 1983, § 102(e) Date Feb. 14, 1983, PCT Pub. No. WO82/04454, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 15, 1982, Ser. No. 466,382

Claims priority, application Sweden, Jun. 15, 1981, 8103748; Jun. 15, 1981, 8103749

Int. Cl.³ E04C *1/00*; F16F *7/10*; E04B *1/98*

U.S. Cl. 52—309.16 **3 Claims**



1. Apparatus for damping vibrations in a structure (**22**) comprising a first body (**24**), a layer of adherent viscoelastic material (**29**) and at least one second body (**30**), said first body being a generally U-shaped body having a web portion (**25**) and two spacing flanges (**26,27**) extending therefrom, said flanges (**26,27**) being adapted to space said web portion (**25**) from said structure (**22**), characterized by said viscoelastic material being applied to the surface (**28**) of said web portion (**25**) intended to face said structure; said second body (**30**) being a generally thread or rod shaped body adherently partially embedded in said viscoelastic material; and fastening means (**31,32;13;36,37**) being provided to fasten said first body to a structure such that vibrations of the structure are transmitted to said first body (**24**).

4,527,372

HIGH PERFORMANCE COMPOSITE FLOOR STRUCTURE

Thomas G. Ryan, Bethel Park, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1983, Ser. No. 488,795

Int. Cl.³ E04B *1/24, 5/19*

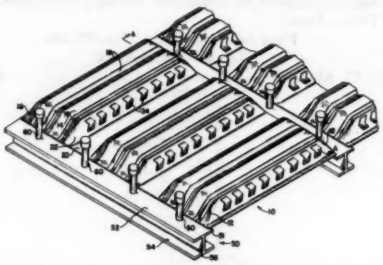
U.S. Cl. 52—334 **4 Claims**

1. A composite floor structure comprising:

(a) a plurality of longitudinally extending spaced apart I-section supporting beams, each beam having a top member, base member and intermediate vertically oriented web member connecting said top and bottom members;

(b) a plurality of horizontally disposed corrugated sheets placed on the I-beams in a manner so that a substantial

portion of the top member of each beam is exposed to allow for direct attachment of studs at any point near a longitudinal center line thereof and each sheet having longitudinally extending crest, valley and intermediate webbing portions oriented transversely with respect to the beams, the crest portions each having a body and two ends which ends each slope downwardly at an obtuse angle with respect to the body closing the ends of the crests, said



crest, valley and intermediate portions merging together at each end of the sheet forming rigid end edges which terminate in a substantially collinear relationship;

(c) a plurality of studs welded to the exposed top portion of at least one of the beams at desired points near the center line thereof and directly over the vertical web portion of the beam; and

(d) concrete covering the sheets and the exposed top portions of the beam and surrounding the studs.

4,527,373

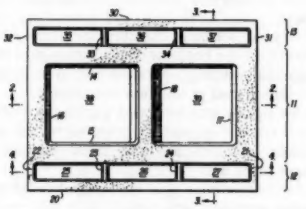
INSULATED CONCRETE MASONRY UNIT WITH LOW DENSITY HEAT BRIDGES

Thomas E. Cruise, 968 Allamanda Dr., Delray Beach, Fla. 33444

Continuation-in-part of Ser. No. 141,056, Apr. 17, 1980, abandoned. This application Jul. 7, 1982, Ser. No. 396,131

Int. Cl.[3] **E04C** *1/40*

U.S. Cl. 52—405 **22 Claims**



1. In a concrete masonry unit comprising a first load-bearing sidewall attached to first and second load-bearing end walls in a perpendicular relationship, and a second load-bearing sidewall attached to said first and second load-bearing end walls in a perpendicular relationship thereby forming at least one central core, said concrete masonry unit further comprising a first outer side wall attached to first and second outer end walls in a perpendicular relationship, said first outer end wall attached to said first load-bearing end wall, said second outer end wall attached to said second load-bearing end wall, said first outer side wall being in a parallel relationship with said first load-bearing side wall thereby forming a first insulation core, and said concrete masonry unit having a composition of a uniform concrete masonry material;

the improvement comprising having said outer end walls of minimal size and of significantly lower density than said load-bearing walls and said outer side wall said lower density caused by a greater amount of air being present in the concrete masonry material, whereby the rate of heat transfer from said outer side wall to said load-bearing walls is reduced, and said concrete masonry unit is of superior insulative value.

4,527,374

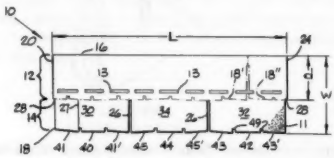
THREE-TAB SHINGLE WITH STAGGERED BUTT EDGE FEATURE

Raymond L. R. Corbin, Littleton, Colo., assignor to Manville Service Corp., Denver, Colo.

Filed Jan. 3, 1980, Ser. No. 109,378

Int. Cl.[3] **E04D** *1/26*

U.S. Cl. 52—557 **8 Claims**



1. In a shingle of generally rectangular planar shape having a headlap portion and a butt portion, said rectangular shape being defined by a top edge at the upper edge of the headlap portion, a butt edge on the lower edge of said butt portion, a leading edge and a trailing edge each extending between said top edge and said butt edge, at least two slot cutouts each having a length which extends from said butt edge across said butt portion towards said headlap portion and terminating a predetermined distance from said top edge, means located on at least one of said leading edge and said trailing edge for indicating said predetermined distance, a first tab extending longitudinally between said leading edge and one of said slot cutouts, a second tab extending longitudinally between said one slot cutout and said trailing edge, said first tab and said second tab being substantially the same length and each tab having a lower edge corresponding to a portion of said butt edge, the improvement comprising:

(a) an alignment edge extending a minor portion of the length of said lower edge of each of said first tab and said second tab for aligning with the terminal end of a slot cutout or an indicating means of a substantially identical subjacent shingle, said alignment edge being generally straight, parallel to and spaced the same distance away from said top edge of the shingle;

(b) the lower edge of said first tab and the lower edge of said second tab each further including a first staggered edge and a second staggered edge, said staggered edges flanking said alignment edge and being angled relative to said top edge and said alignment edge, whereby said staggered edges together with said alignment edges operate to give said butt edge a jagged, non-uniform appearance;

(c) a center tab extending longitudinally between said two slot cutouts and said first tab and said second tab, said center tab having a lower edge corresponding to a portion of said butt edge and including an alignment edge extending a minor part of the length of said lower edge, said alignment edge being straight and parallel to said top edge and being spaced from said top edge the same distance as the alignment edge of said first tab and said alignment edge of said second tab;

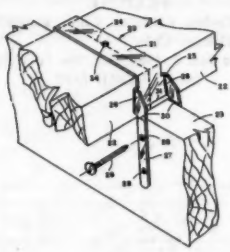
(d) Said center tab further including a third staggered edge and a fourth staggered edge, said third and fourth staggered edges flanking said alignment edge and being angled relative to said top edge and to said alignment edges, both said third and said fourth staggered edges being angled relative to said first staggered edge and said second staggered edge of each said first and second tabs.

4,527,375

DECK BOARD ANCHOR BRACKET

Paul A. Braginetz, Staunton, Va., assignor to B. P. Fishburne, Jr., Washington, D.C. and Marlin G. Wilson, Staunton, Va.

Filed Dec. 1, 1983, Ser. No. 556,937
Int. Cl.[3] E04B *1/38*
U.S. Cl. 52—712 7 Claims



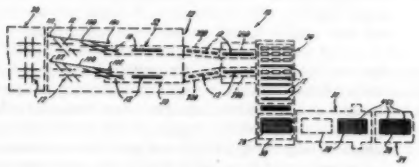
1. A bracket formed from a unitary piece of material comprising an elongated flat plate body portion, opposite end substantially perpendicular comparatively short plate extensions on said body portion extending beyond one face thereof only, and a pair of anchor arms for the bracket on each end thereof and being comparatively narrow and elongated in planes which are substantially perpendicular to the planes occupied by the plate body portion and said plate extensions, said arms being joined near corresponding ends thereof to opposite edge portions of the plate extensions and said corresponding ends of the arms being spaced from the plate body portion in the direction which the plate extensions extend away from the plate body portion, the arms of each pair being in spaced laterally opposing generally parallel relationship near and outwardly of the opposite longitudinal edges of the plate body portion, and the arms having free ends spaced substantial distances away from the plate body portion and away from the ends of the plate extensions, the arms forming with the plate extensions substantially U-shaped yokes which are arranged in back-to-back spaced relationship at the ends of the plate body portion.

4,527,376

APPARATUS FOR PROCESSING BOX PARTITIONS

David W. Mauger, Wilton, Conn.; James W. Lawrie, Capitola, Calif.; John T. McCarthy, N. Falmouth, Mass., and Michael A. Tozzi, Mequon, Wis., assignors to Clevepak Corporation, Milwaukee, Wis.

Filed Nov. 28, 1980, Ser. No. 210,541
Int. Cl.[3] B65B *27/08*
U.S. Cl. 53—113 34 Claims



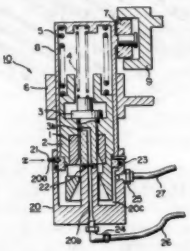
1. A machine for processing assembled box partitions, said machine comprising means for collapsing the assembled partitions to a flat, generally vertical, configuration, said collapsing means applying positive advancing forces to each assembled partition to force said assembled partitions to move along a predetermined path, said collapsing means holding said assembled partitions generally vertical while said assembled partitions are moved along said predetermined path, said collapsing means collapsing and further advancing individual collapsed partitions along said predetermined path prior to compiling and bundling said collapsed partitions.

4,527,377

WASHING DEVICE IN A CONTAINER SEALING APPARATUS

Masayuki Hayashi, and Masatoshi Suzuki, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,303
Int. Cl.[3] B65B *65/00*
U.S. Cl. 53—167 4 Claims



1. In a container sealing apparatus of the type including a rotary body rotatable about a vertical axis, a plurality of plunger units mounted about said body for rotation therewith, and means for raising and lowering said plunger units during rotation and thereby for moving said plunger units into and out of sealing engagement with respective containers during a production operation, each said plunger unit comprising a head cylinder, a slider mounted for sliding movement within said head cylinder, and a stopper-striking head mounted for sliding movement within said slider, the improvement of means for washing portions of said plunger units during a washing operation after interruption of the production operation, said washing means comprising:

a plunger passageway extending through each said plunger units;

a plurality of washing chamber members adapted to be mounted on the bottoms of respective said plunger units during said washing operation and to be detached therefrom during said production operation;

means for rigidly attaching said washing chamber members to said respective plunger units, such that said washing chamber members are suspended by said respective plunger units; and

means for circulating a washing liquid through said washing chamber members into contact with said portions of said plunger units and through said plunger passageways.

4,527,378

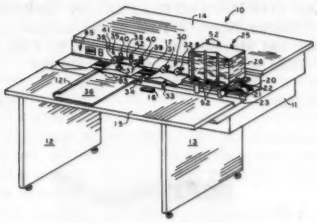
SEMI-AUTOMATIC INSERTION MACHINE

Robert J. Russell, Medford, N.J., assignor to Mail-Ex Corporation, Stratford, Conn.

Continuation of Ser. No. 106,239, Dec. 21, 1979, abandoned, which is a continuation of Ser. No. 940,728, Sep. 7, 1978, abandoned. This application Jan. 7, 1982, Ser. No. 337,835
Int. Cl.[3] B65B *67/02*
U.S. Cl. 53—266 A 11 Claims

1. A machine for facilitating the manual insertion of materials by an operator into envelopes of the type having a body and an adjacent seal flap prefolded in an unsealed closed position over said body, said machine comprising: a hopper for containing a quantity of envelopes; an inserting station; conveying means for transporting the envelopes in succession from said hopper to said inserting station; a table top extending along and

adjacent to said conveying means; said conveying means being adapted for transferring the envelopes from said hopper to said inserting station in a substantially horizontal disposition with said envelope flaps facing said table top; envelope flap unfolding means for bending the flap of each envelope towards said table top from its prefolded unsealed closed position to a position substantially in line with its body; a guide plate associated with said table top adjacent to said inserting station and arranged to receive the unfolded envelope flaps thereunder; envelope opening means at said inserting station for disposing



each envelope in an opened condition facing said guide plate to facilitate the manual guiding of materials along said guide plate towards the opened envelopes and the manual insertion of the materials into the envelopes by an operator; and means for releasably holding the envelopes in engagement with said conveying means comprising a pair of rollers located at said inserting station, said rollers being arranged for reciprocating movement for being spaced from the envelopes while the envelopes are opened and for engaging the envelopes during transportation of the envelopes by said conveying means.

4,527,379

APPARATUS FOR CONNECTING OVERLAPPING ENDS OF A STRAPPING BAND TENSIONED ABOUT A PACKAGE

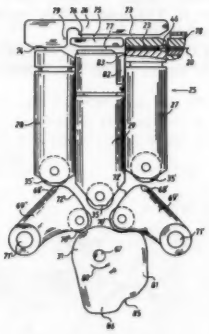
Günter Bartzick, Ennepetal; Gerd Bühne, Schwelm, and Reinhard Naydowski, Remscheid, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,245

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220445

Int. Cl.³ B65B *13/32*

U.S. Cl. 53—589 **23 Claims**



1. Apparatus for tensioning a plastic strapping band obtained from a supply reel and positioned around a package, for connecting overlapping ends of the band by hot bonding, and for cutting off a length of band leading from the supply reel and not utilized in wrapping, said apparatus comprising: a band guide; means for advancing and tensioning a strapping band that is initially advanced in said band guide, said band guide surrounding but not being in contact with the package to be wrapped and being subsequently drawn back into a position in contact with the package while a free end of the band is held in place and then tensioned; fastening means for hot bonding overlapping ends of the band; a backing plate between the band and the package; first, second and third plungers aligned along a longitudinal axis of the band and applicable against said backing plate, said first plunger securing the free front end of the band, said second plunger securing rear end of the band, said third plunger being a middle plunger forcing the overlapping ends of the band against hot-bonding means comprising a heated cutter compressing molten band ends together and cutting off a length of the strapping band leading from the supply reel and not utilized in wrapping, a single disk cam on a shaft perpendicular to the longitudinal axis of the band, said disk cam having a single cam contour track, said three plungers aligned along the longitudinal axis of the band being activated by said single disk cam.

4,527,380

LAWN MOWER

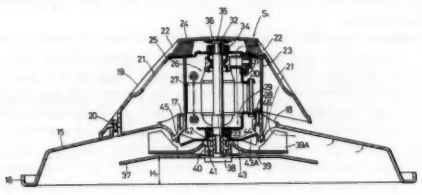
Fusao Fushiya; Nobuhiro Inoue, and Setsuo Saito, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Aichi, Japan

Filed Sep. 7, 1983, Ser. No. 530,010

Claims priority, application Japan, May 31, 1983, 58-83305; Aug. 9, 1983, 58-124273

Int. Cl.³ A01D *35/26*

U.S. Cl. 56—12.8 **3 Claims**



1. A lawn mower comprising:

a motor having a motor shaft;

a motor housing vertically enclosing said motor therein;

a cutter rotatably secured to said motor shaft of said motor;

a cutter casing connected to the lower end of said motor housing in communicating relation to said motor housing and housing said cutter therein;

a shroud mounted on said cutter casing and enclosing said motor housing therein;

an axial impeller secured to said motor shaft above said cutter for creating a flow of air for cooling said motor;

an air impeller secured to said motor shaft below said axial impeller and above said cutter for drawing a flow of air to create an air cushion in conjunction with said cutter casing, said air impeller having a shank portion surrounding said motor shaft with a mounting groove defined in the lower end thereof and opening downward toward the underlying cutter; and

a spacer surrounding said motor shaft and removably interposed between said cutter and said air impeller, said spacer having axially aligned and opposed end portions with projecting ridge means between said end portions and axially offset whereby said end portions are of unequal length and define a long leg and a short leg, said mounting groove being of a predetermined depth, said long leg and said short leg each being selectively received in said mounting groove and each being of a length less than the depth of said groove, said projecting ridge means limiting insertion of each leg by engagement of said projecting ridge means against said shank portion, whereby

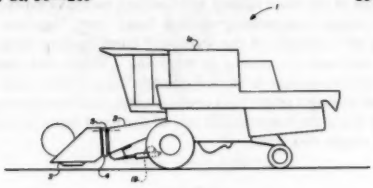
said spacer, through a selective mounting thereof, provides for an adjustment of the height of said cutter.

4,527,381

LATERAL FLOTATION MECHANISM FOR COMBINE HARVESTERS

Harry F. Mann, Hampton, Australia, assignor to Sperry Corporation, New Holland, Pa.

Filed Oct. 13, 1983, Ser. No. 541,759
Int. Cl.³ A01D *67/00*
U.S. Cl. 56—209 **10 Claims**



1. In a harvester apparatus having a base harvesting unit, a header for receiving and feeding crop material to a combine harvesting unit, a feederhouse connected to said base harvesting unit and a header support means interconnecting said feederhouse and said header, including pivotal means for supporting said header for rotation about a substantially longitudinal axis relative to said combine harvesting unit, the improvement comprising:

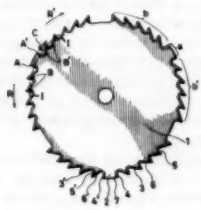
means operably disposed between said feederhouse and said header for applying a predetermined stabilizing moment in at least one direction about said longitudinal axis, the arrangement being such that in the absence of any external load, said header is maintained in a stable predetermined relationship relative to the combine base harvesting unit with respect to pivotal movement about said longitudinal axis, said header being pivotable about said longitudinal axis upon an application thereto of an external force causing a turning moment greater than said stabilizing moment, said means for applying moment acting to return said header toward said predetermined relationship when said external force is lessened.

4,527,382

MOWING ROTARY SAWTOOTHED CUTTER

Toshio Aono, 2185-2, Fukui, Miki-shi, Hyogo-ken, Japan

Filed Aug. 2, 1983, Ser. No. 519,571
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 **5 Claims**



1. A moving rotary sawtoothed cutter comprising:

a disk made of a chemically synthesized material or steel having a central hole;

a suitable number of large cutting blades disposed around the periphery of said disk, each blade having cutting edges on both lateral sides thereof and an intervening arc-shaped outer periphery; and a suitable number of triangular small cutting blades disposed in opposite relation to each other between said large cutting blades, each blade having cutting edges extending from the apex of the triangle along the opposite lateral edges thereof, said small blades having their apexes falling on the circumference of a circle concentric with a circle the circumference of which falls on the outer periphery of the large cutting blades.

4,527,383

THREADS FOR IDENTIFICATION OF GARMENTS

Wallace K. Bingham, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1983, Ser. No. 479,464
Int. Cl.³ D02G *3/34, 3/06*
U.S. Cl. 57—200 **18 Claims**

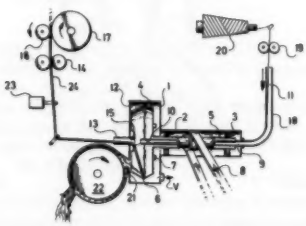
1. A thread comprising a filament made of polymeric material to which has been applied a microscopic symbol which is visibly detectable and readable only under magnification.

4,527,384

METHOD OF AND APPARATUS FOR PRODUCING MULTICOMPONENT SPUN-TWISTED YARNS BY OPEN-END SPINNING

Alois Stejskal; Zdenek Havranek, both of Usti nad Orlici; Miroslac Stepanek, Sopotnice; Jan Hrdina, Usti nad Orlici; Frantisek Cada, Usti nad Orlici; Zelmira Borovcova, Usti nad Orlici, and Jaroslav Slingr, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavinarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 25, 1983, Ser. No. 545,087
Int. Cl.³ D01H *7/882, 1/12*; D02G *3/38*
U.S. Cl. 57—404 **3 Claims**



1. In a method of producing multicomponent spun-twisted yarns in the spinning rotor exposed to a sub-atmospheric pressure of an open-end spinning unit, wherein one of the components is a staple yarn being spun in the spinning rotor while the

other component is a strand material which is supplied by a pair of feed rollers to the spinning rotor through a feeding tube passing through the hollow spindle of the spinning rotor at a speed exceeding the take-off speed of the spun-twisted yarn which is withdrawn from the spinning rotor through a stationary take-off funnel having a frictional surface,

the improvement wherein the supplied strand material on its way to the spinning rotor is exposed to two active fields of force, viz. a first pneumatic field of force produced in the feeding tube by an air flow speed, and a second mechanical field of force produced by a combination of an axial force in the staple yarn being built, together with a centrifugal force of a rotating portion of the strand material, and of the resultant of frictional forces produced on the frictional surface of the take-off funnel, the resulting transport effect of the pneumatic field of force being higher than the resulting transport effect of the mechanical field of force, said higher effect causing a relative rotary motion of the strand material, introduced into the spinning rotor, about the axis of the staple yarn which is thus wrapped up by said strand material in a twist point on the frictional surface of said take-off funnel.

2. In an apparatus for carrying out the method of producing a multicomponent spun-twisted yarn, said apparatus comprising of an open-end spinning rotor exposed to a sub-atmospheric pressure of an open-end spinning unit, said rotor having a hollow spindle and a spinning space within said rotor, a feeding tube passing through the hollow spindle of the spinning rotor into the spinning space of said rotor, a pair of feed rollers for supplying strand material into the spinning rotor through said feeding tube, an axially arranged stationary take-off funnel disposed within the spinning space in the rotor, a pair of take off rollers for withdrawing the spun-twisted yarn through the take-off funnel, and an air outlet for the spinning rotor, the improvement wherein the cross-sectional area of the feeding tube is determined by the dependence upon the total air volume through flow at the air outlet of the spinning rotor on the basis of the equation

$$S = \frac{V}{0.9 \text{ to } 2.5}$$

in which

S is the cross-sectional area of the feeding tube in square millimeters, and

V is the total air volume throughflow in liters per second.

4,527,385

SEALING DEVICE FOR TURBINE BLADES OF A TURBOJET ENGINE

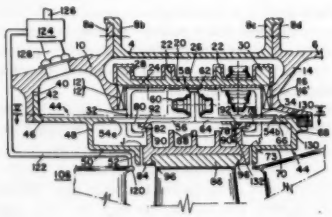
Louis F. Jumelle, Ris-Orangis, and Marcel R. Soligny, Chevilly-Larue, both of France, assignors to Societe Nationale d'Etude et Je Construction de Moteurs d'Aviation "S.N.E.C.M.A." , France

Filed Jan. 30, 1984, Ser. No. 575,319

Claims priority, application France, Feb. 3, 1983, 83 01671

Int. Cl.[3] F01D *11/08*; F02C *6/18*

U.S. Cl. 60—39.07 **27 Claims**



1. In a turbojet engine having a compressor, an outer casing having a longitudinal axis, and at least one turbine wheel rotatably mounted within the casing, the turbine wheel having a plurality of turbine blades attached thereto, a device for effecting a seal between the turbine blades and the outer casing during stabilized and transitory operating modes of the engine, comprising:

(a) an annular external ring attached to the outer casing;

(b) an internal ring structure having a higher coefficient of thermal expansion than the external ring, attached to the outer casing, the internal ring also having a plurality of longitudinally extending, cantilevered control fingers disposed about its circumference, each control finger having a distal end;

(c) a plurality of sealing segments disposed radially outwardly of the tips of the turbine blades, each of the sealing segments having a sealing surface disposed in close proximity to the tips of the turbine blades;

(d) first attachment means attaching each of the sealing segments to the internal ring structure;

(e) second attachment means attaching each of the sealing segments to the external ring; and,

(f) means to direct air from a stage of the compressor onto the external ring and the internal ring structure such that the thermal expansion/contraction of the internal ring structure and the external ring moves the sealing segments radially outwardly/inwardly corresponding to the expansion/contraction of the blade tips due to different operating modes of the engine in order to maintain clearance between the blade tips and the sealing segments, and to prevent excess air leakage between the blade tips and the sealing segments.

4,527,386

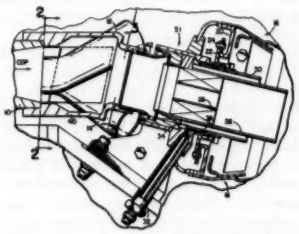
DIFFUSER FOR GAS TURBINE ENGINE

Stanley J. Markowski, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 28, 1983, Ser. No. 470,369

Int. Cl.[3] F02C *3/14*

U.S. Cl. 60—39.36 **2 Claims**



1. In combination with an annular burner having an inner and outer liner defining an annular combustion chamber, a dome interconnecting said inner and outer liner for covering the front end of said annular combustion chamber, a plurality of air injectors mounted on apertures circumferentially formed around the front end of said dome, each of said air injectors having a first straight through central passageway for leading compressor discharge air in the central portion of the annular space of said annular combustion chamber for defining the secondary flow of combustion and dilution air, an annular straight through passage defining a second passageway concentric with said first passageway for leading the compressor discharge air into the annular space of said annular combustion chamber, a diffuser feed system having an annular prediffuser, a plurality of first pipes having a conical portion flaring from a smaller to larger diameter in the direction of flow for effectuating diffusion of the air stream for leading high total pressure diffused air in a cavity surrounding said annular combustion

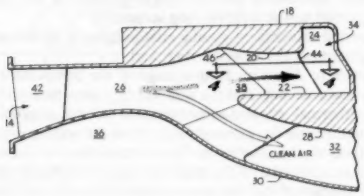
chamber, and a straight through pipe collecting air adjacent the boundary of said prediffuser connected to the front of each of said air injector and said first pipes connected to the discharge end of said prediffuser but spaced from said boundary layer to deliver solely the air with the higher total pressure of the air in said prediffuser.

4,527,387

PARTICLE SEPARATOR SCROLL VANES

Frank A. Lastrina, Andover; Leslie M. Pommer, Danvers, both of Mass., and Jeffrey C. Mayer, Seymour, Conn., assignors to General Electric Company, Lynn, Mass.

Filed Nov. 26, 1982, Ser. No. 444,570
Int. Cl.³ F02G 3/00
U.S. Cl. 60—39.092 **13 Claims**



1. In a gas turbine engine having an annular intake passageway for receiving engine intake air, a compressor, a pair of spaced-apart wall members defining an annular compressor inlet in flow communication with the annular intake passageway and an inlet particle separator including wall means defining an annular collection chamber disposed radially outwardly of said pair of wall members defining said compressor inlet and being in flow communication with said annular intake passageway for receiving and removing extraneous matter from a stream of air supplied to the compressor inlet by way of said annular intake passageway and means for directing the extraneous matter out of the air stream within the annular intake passageway into the collection chamber; scavenging means for said inlet particle separator comprising:

a plurality of circumferentially spaced collector flowpath vanes located within an annular entrance of said collection chamber, wherein said collector flowpath vanes extend radially between said wall means defining said collection chamber and each vane has a leading edge and two oppositely extending substantially flat upstream faces extending radially between said wall means and joining together along said leading edge, and wherein said upstream faces of adjacent ones of said vanes are angled towards air flow stream direction in said annular entrance to define a converging channel therebetween effective for accelerating airflow therethrough, said flowpath vanes thereby being effective for substantially preventing bouncing of extraneous matter off of said collector flowpath vanes into said intake passageway.

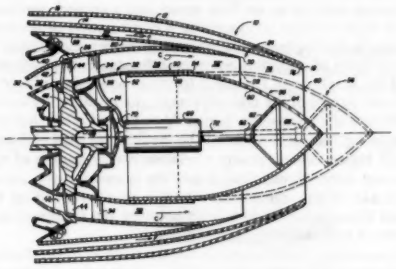
4,527,388

JET PROPULSION APPARATUS AND METHODS

Frank B. Wallace, Jr., Fairfield, Ohio, assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jui. 12, 1982, Ser. No. 397,728
Int. Cl.³ F02K 1/08, 1/09, 1/38
U.S. Cl. 60—204 **30 Claims**

26. In a turbofan jet engine having a fan portion supplying pressurized fluid to a nozzle portion via bifurcated flow path means extending therebetween, one portion of said pressurized fluid flowing to said nozzle portion via a core engine portion substantially defining one branch of said bifurcated flow path means, the remaining portion of said pressurized fluid flowing to said nozzle portion via fan bypass passage means substantially defining the other branch of said bifurcated flow path means, said nozzle portion defining an exhaust nozzle throat through which said pressurized fluid is discharged, the ratio of said remaining fluid portion to said one fluid portion establishing a bypass ratio for said engine, the method of simultaneously varying both said bypass ratio and the fluid flow area of said



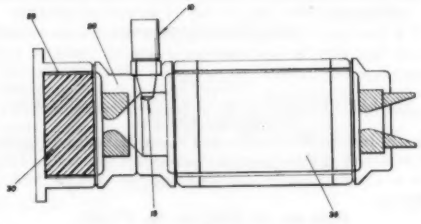
exhaust nozzle throat comprising the steps of providing a single axially movable member axial movement of which adjusts the area of said exhaust nozzle throat, utilizing said member to substantially define a portion of at least one branch of said bifurcated flow path means, and axially moving said member to adjust at least one of said one fluid portion and said remaining fluid portion.

4,527,389

HIGHLY SOLUBLE, NON-HAZARDOUS HYDROXYLAMMONIUM SALT SOLUTIONS FOR USE IN HYBRID ROCKET MOTORS

Richard A. Biddle, Elkton, Md., and Ernest S. Sutton, Landenberg, Pa., assignors to Thiokol Corporation, Chicago, Ill.

Filed Jun. 21, 1982, Ser. No. 390,570
Int. Cl.³ C06D 5/00
U.S. Cl. 60—207 **3 Claims**



1. A process for increasing the thrust of a rocket motor comprising a primary combustion chamber, a solid propellant grain within said primary chamber which generates combustion gas when ignited, a secondary combustion chamber aft of said primary chamber, and a passage connecting said primary and secondary chambers for conducting said combustion gas from said primary chamber to said secondary chamber, said process comprising the steps of:

(a) providing a supply of an aqueous solution comprising from 50% to 90% by weight of a hydroxylammonium salt selected from the group consisting of hydroxylammonium nitrate and hydroxylammonium perchlorate; and

(b) contacting said combustion gas with said solution substantially within one of said passage and said secondary chamber at selected times, thereby reacting said combustion gas and said solution in said secondary chamber to increase thrust during said selected times.

4,527,390

LOW LOSS DUCT BURNER

Henry M. Mar, and Samuel B. Reider, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 25, 1977, Ser. No. 845,424
Int. Cl.[3] F02K 3/06
U.S. Cl. 60—224 2 Claims

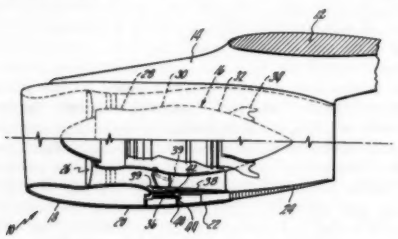
1. A duct burner assembly for use with a fan bypass turbojet engine having a fan discharge duct therein in communication with a flow diffuser passage for expanding fan discharge air comprising: an afterburner inlet, a plurality of movable flame stabilizers located within said afterburner inlet and operative to maintain a stabilized flame front at said afterburner inlet, each of said stabilizers including a pair of blades extending through the vertical extent of said afterburner inlet, actuator means for positioning said blades in a retracted position against one another to reduce flow interference through said afterburner inlet, said actuator means being operable to locate said blades in an expanded position to restrict cold air flow through said afterburner inlet during afterburner operation, means for directing fuel into the afterburner inlet during afterburner operation, a hot gas supply having ports in communication with the afterburner inlet, each of said blades including flow controller means thereon to block passage of hot gas into the afterburner inlet when the blades are in their retracted position, said flow controller means being operable when said blades are in their expanded position to direct hot air into the afterburner inlet for mixture with cold bypass air flow therethrough during afterburner operation so as to widen the stability of combustion of air and fuel within the afterburner during afterburner operation.

4,527,391

THRUST REVERSER

Jon A. Marx, and Wendell R. Loso, both of Manchester, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1982, Ser. No. 431,474
Int. Cl.[3] F02K 1/62
U.S. Cl. 60—226.2 2 Claims



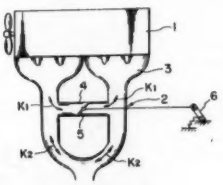
1. A nacelle in combination with a fan-jet engine for powering an aircraft having a casing, said fan jet engine completely disposed within said nacelle, said nacelle comprising a generally cylindrically shaped hollow wall surrounding said engine and being spaced therefrom for defining with said casing an annular passage for conducting fan air to discharge downstream of the engine relative to the flow of engine fluid working medium, the annular passage having an inlet spaced upstream from said engine and an exit spaced downstream from said engine, flow reversing means interposed intermediate said inlet and said outlet for leading air in said annular passage to ambient bypassing said exit, said flow reversing means including a cascade, a pair of spaced concentric slidable sleeves sandwiching said cascade, one of said sleeves being moveable rectilinearly and means including a pair of mating gears and a pair of cooperating racks, each of said cooperating racks attached to a respective sleeve and each of said racks engaging one of said respective gears so that the other said gears is rotated to position its respective rack so that the other of said sleeves is positioned by the rectilinear movement of said one of said sleeves whereby both sleeves expose said cascade to ambient, whereby both sleeves are deployed in the same direction.

4,527,392

BYPASS VALVE ACTUATOR FOR INERTIA SUPERCHARGING IN MULTICYLINDER ENGINES

Akihiko Sato, and Akira Watanabe, both of Hino, Japan, assignors to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 485,815
Int. Cl.[3] F02B 27/00
U.S. Cl. 60—313 4 Claims



1. An internal combustion engine comprising:
a pair of intake manifolds having intake passages, respectively;
a bypass passage interconnecting said intake passages and having a bypass valve disposed therein for shifting the turning point for inertia supercharging;
an accelerator-responsive lever;
a bypass valve actuator operatively connected between said bypass valve and said accelerator-responsive lever for closing said bypass valve when the engine load increases;
said bypass valve actuator comprising a link operatively connected at one end to said accelerator-responsive lever and a lever connected to said bypass valve, said link having an opposite end connected to said lever through a lost-motion connection.

4,527,393

CONTROL DEVICE FOR A HYDROSTATIC TRANSMISSION

John E. G. Young, Watertown, N.Y., assignor to General Signal Corporation, Stamford, Conn.

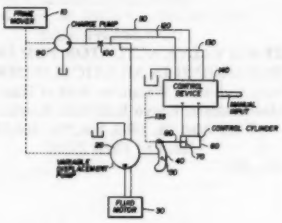
Filed Sep. 2, 1981, Ser. No. 298,883
Int. Cl.[3] F16D 31/02
U.S. Cl. 60—327 17 Claims

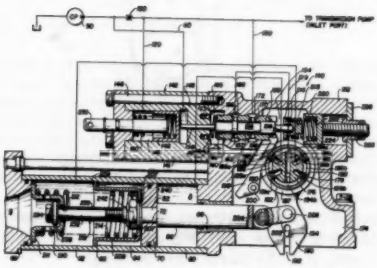
1. A hydrostatic transmission, comprising:
a prime mover which operates at a variable speed;
a variable displacement pump including a displacement control element and powered by said prime mover;
a fluid motor powered by said variable displacement pump;
speed sensing means for sensing the speed of said prime mover and producing a speed signal;
fluid actuated position control means for controlling the position of said displacement control element;
selector means for determining neutral, forward or reverse modes of operation of said variable displacement pump by defining fluid paths to said fluid actuated position control means as a function of a selected mode;
compensator means having high and low pressure input

ports and output ports connected to said selector means for providing a high or low pressure signal on said output port as a function of said speed signal; and

feedback means for transmitting a mechanical feedback signal representing the displacement of said variable displacement pump to said selector means and said compensator means to maintain said variable displacement pump at a displacement as a function of said selected mode and said sensed speed of said prime mover.

14. The method of claim **13** further comprising the steps of:





powering a fixed displacement pump with said prime mover to produce a fluid flow from said fixed displacement pump proportional to the speed of said prime mover;

generating a pressure differential proportional to the speed of said prime mover at an outlet of said fixed displacement pump;

sensing said pressure differential; and

producing a mechanical speed signal in response to said pressure differential when said pressure differential exceeds a predetermined value.

4,527,394

HEATER HEAD FOR STIRLING ENGINE

John A. Corey, R.D. #2, Box 101 E, North Troy, N.Y. 12182

Filed Jan. 17, 1984, Ser. No. 571,536

Int. Cl.[3] **F02G** *1/04*

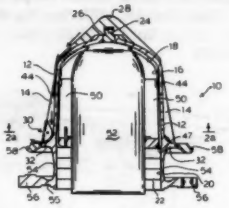
U.S. Cl. 60—517 **16 Claims**

1. A heater head assembly for use in a Stirling engine and the like, said assembly comprising:

a vessel having a vessel wall with an internal and external surface, said external surface adapted to be exposed to external heat created by a combustion gas stream, said internal surface adapted to form a Stirling engine pressure cylinder containing a working gas;

a plurality of external fins on said external surface forming respective channels therebetween for channeling the combustion gas therethrough; and

at least one removable stuffer means positioned in a channel formed between adjacent external fins dividing said channel into at least two smaller channels thereby concentrating the combustion gas to flow closely by the respective



adjacent fins so as to increase thermal energy transfer from the combustion gas to working gas within the vessel.

4,527,395

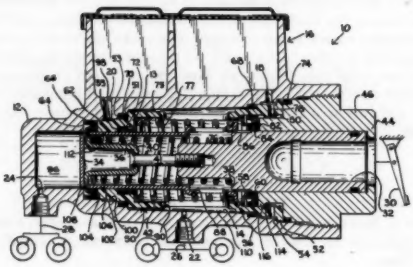
MASTER CYLINDER

Robert F. Gaiser, Stevensville, and Larry G. Lohraff, Berrien Springs, both of Mich., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 270,428, Jun. 4, 1981, abandoned. This application Oct. 1, 1984, Ser. No. 656,294

Int. Cl.[3] **B60T** *11/20*

U.S. Cl. 60—562 **2 Claims**



1. A master cylinder comprising a housing having an axially extending bore, a pair of pistons movably disposed within the bore and cooperating with a pair of pressure chambers, respectively, to generate fluid pressure therein in response to movement of the pair of pistons within the bore, a sleeve assembly disposed within the bore, the sleeve assembly including an inner surface and an outer surface exposed to fluid pressure generated in one of said pair of pressure chambers, the sleeve assembly including a slot to communicate fluid pressure from the inner surface to the outer surface, and a pair of seals cooperating with the sleeve assembly to seal the latter within the one pressure chamber, characterized by said pair of seals engaging said sleeve assembly at substantially the same axial position so that fluid pressure acting against the inner surface adjacent said pair of seals will be offset by the fluid pressure acting against the outer surface adjacent said pair of seals to reduce deformation of said sleeve assembly in response to fluid pressure, said sleeve assembly having a substantially uniform thickness except for one end thereof which is provided with an enlarged thickness, forming a sliding interface with one of the pistons, said one end substantially adjoining said pair of seals, said housing bore including a wall defining a first shoulder which engages one of said pair of seals, said first shoulder aligning with a second shoulder formed by said sleeve assembly which engages the other of said pair of seals, whereby said first and second shoulders fixedly locate said pair of seals in alignment with said sleeve assembly adjacent said one end and

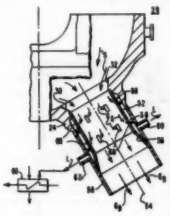
said one end extends away from said pair of seals toward said other pressure chamber.

4,527,396

MOISTURE SEPARATING DEVICE

George J. Silvestri, Jr., Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 23, 1983, Ser. No. 535,135
Int. Cl.[3] F01K *17/00*
U.S. Cl. 60—685 10 Claims



1. An apparatus for removing moisture from a moisture laden stream of gas flowing in a pipe, comprising:

a cylinder having an outer diameter which is smaller than the inner diameter of said pipe;

means for supporting said cylinder generally inside said pipe in generally coaxial association with said pipe, said generally coaxial association forming an annular space between said cylinder and said pipe;

means for preventing fluid flow from said annular space to said pipe in a direction which is generally parallel to said stream of gas;

means for removing a fluid from said annular space in a direction away from said pipe;

means for permitting a fluid to flow from said cylinder into said annular space;

a plurality of axially aligned longitudinal barriers generally extending the length of said annular space dividing said annular space into a plurality of separately enclosed arcuate segments each of which has fluid removing means in fluid communication therewith and has means for permitting fluid to flow from said cylinder cooperatively associated therewith; and

said apparatus being disposed in said pipe downstream of a change in the direction of said stream of gas whereby moisture is separated from said gas stream and is removed from said pipe by said apparatus.

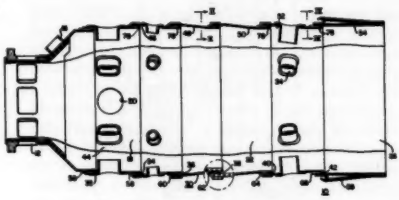
4,527,397

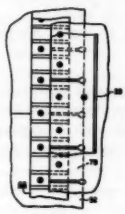
TURBINE COMBUSTOR HAVING ENHANCED WALL COOLING FOR LONGER COMBUSTOR LIFE AT HIGH COMBUSTOR OUTLET GAS TEMPERATURES

Edward W. Tobery, Westtown Township, Chester County, and Stephen R. Parker, Nether Providence, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 248,123, Mar. 27, 1981,. This application Jul. 28, 1983, Ser. No. 517,929
Int. Cl.[3] F02C *7/18*
U.S. Cl. 60—757 10 Claims

1. A combustor for a stationary gas turbine having a generally tubular sidewall, said sidewall having a plurality of tubular sidewall members disposed in a generally telescopic arrangement, spacer means secured between an outwardly located upstream end portion of each of said sidewall members and an inwardly located downstream end portion of the adjacent upstream sidewall member to provide a generally annular coolant air admission slot between said end sidewall portions, said downstream end portion of at least one of said sidewall members having a generally tubular lip extending downstream from the downstream end of said spacer means to dissipate wakes in the associated slot coolant air flow, and said sidewall member upstream end portion of the next downstream sidewall member having deflection means which is structured to deflect radially outwardly and inwardly in such a manner that said spacer means and said one inner sidewall member including said extended lip are permitted to expand and contract in the radial direction under thermal load cycling substantially without lip buckling and without disturbing the coolant air film admitted through the associated annular coolant slot, said deflection means including an upper end section of said next downstream sidewall member having a plurality of circumferentially spaced slots extending in the downstream direction over the inwardly located coolant slot, and resilient means for covering said slotted end section substantially to prevent air admission through said slots when radial deflection occurs.





4,527,398

CASCADE DESICCANT AIR-CONDITIONING/AIR DRYING PROCESS AND APPARATUS WITH COLD THERMAL ENERGY STORAGE

Walter J. Schaetzle, 9 Oak Bluff, Northport, Ala. 35476

Filed Jan. 16, 1984, Ser. No. 571,071
Int. Cl.[3] F25D *17/06*
U.S. Cl. 62—94 12 Claims

1. A cascade desiccant air-conditioning process for conditioning an air flow utilizing a plurality of desiccating means, comprising:

desiccating said air flow by removing moisture therefrom to produce a desiccated air flow, wherein said step of desiccating said air flow further comprises passing said air flow through said plurality of desiccating means such that said moisture of said air flow is absorbed by said plurality of desiccating means;

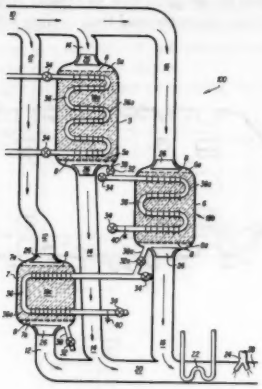
cooling said desiccated air flow to produce a cooled, desiccated air flow by passing said desiccated air flow through heat exchanging means;

chilling said cooled, desiccated air flow to produce a conditioned air flow, wherein said step of chilling said cooled, desiccated air flow further comprises injecting water into said cooled, desiccated air flow such that said water is adiabatically evaporated by said cooled, desiccated air flow to lower a temperature of said cooled, desiccated air flow;

exhausting said conditioned air flow; and

desorbing said moisture absorbed by said plurality of desic-

cating means as steam in a cascade manner wherein a first steam produced by desorbing serves as an energy source for subsequent desorbing to produce a second steam such that a major increase in a thermal coefficient of perfor-



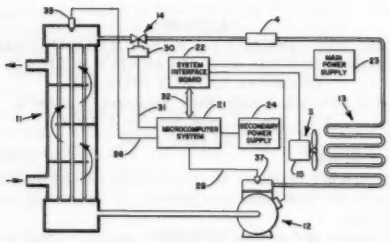
mance of said cascade desiccant air-conditioning process is effected by recovering a latent heat of vaporization of said moisture through desorption of said moisture from said plurality of desiccating means as said first and second steam.

4,527,399

HIGH-LOW SUPERHEAT PROTECTION FOR A REFRIGERATION SYSTEM COMPRESSOR

Richard G. Lord, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,340
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—212 **2 Claims**



1. A method of operating a refrigeration system including a compressor for compressing gaseous refrigerant supplied to the compressor from an evaporator, comprising:

sensing the temperature of the gaseous refrigerant provided to the compressor from the evaporator;

sensing the saturation temperature of the refrigerant in the evaporator;

comparing the sensed temperatures to deterine the superheat of the gaseous refrigerant flowing from the evaporator to the compressor;

shutting down operation of the refrigeration system when the superheat is continuously greater than a preselected upper limit for a first preselected amount of time and the sensed saturation temperature is simultaneously less than a preselected lower limit; and

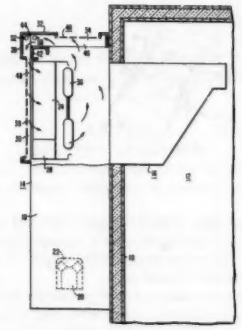
shutting down operation of the refrigeration system when the superheat is continuously less than a preselected lower limit for a second preselected amount of time.

4,527,400

AIR SHUTTER ARRANGEMENT FOR TRANSPORT REFRIGERATION UNIT

Donald W. Greenheck, Shoreview, and Lowell M. Anderson, Bloomington, both of Minn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1980, Ser. No. 171,601
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—239 **7 Claims**



1. In a transport refrigeration unit of the type having an internal combustion prime mover and including a cabinet external of the space being conditioned, and having a refrigerant condenser and a cooling radiator for said prime mover in the upper portion of said cabinet along with a fan for moving air through said condenser and radiator, the cabinet having a front opening and top opening, an airflow control arrangement comprising:

front shutter means in said front opening;

top shutter means in said top opening;

means for controlling the opening of said top and said front shutter means independently of each other and in response to temperature sensed within said cabinet, said controlling means being operative to initiate opening of said top shutter means upon a rising sensed temperature less than the temperature at which opening of said front shutter means is initiated.

4,527,401

APPARATUS AND METHOD FOR MAKING ICE PARTICLES AND METHOD OF MAKING SAID APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Oct. 5, 1983, Ser. No. 539,091
Int. Cl.³ F25C *1/14*
U.S. Cl. 62—354 **18 Claims**

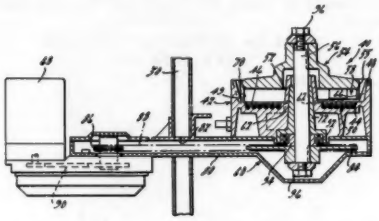
1. An ice making apparatus comprising:

a refrigeration system including a combination evaporator and ice-forming assembly; and

means communicating a source of ice make-up water to said assembly;

said assembly including a generally horizontal freezer plate, conveying means for conveying said make-up water onto a generally horizontal freezing surface on one side of said freezer plate, said conveying means including manifold means having a plurality of circumferentially-spaced outlets for distributing said make-up water onto a plurality of locations on said freezer surface, evaporator means disposed on the opposite side of said freezer plate from said

freezing surface, a rotatable ice breaker disposed generally adjacent said freezer surface for rotation about an axis generally perpendicular to said horizontal freezing surface, said ice breaker being generally disc-shaped and having at least one blade-like member on a face thereof that is oriented toward said freezer plate, said blade-like member extending generally horizontally along a generally spiral-shaped path from a radially inward position on said ice breaker to a radially peripheral position thereon, an edge portion of said blade-like member being located in close proximity with said freezer surface but axially

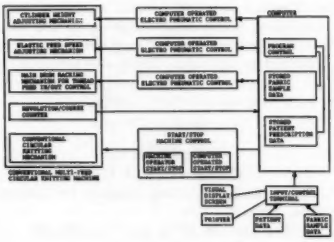


spaced therefrom in order to forcibly fracture ice thereon into formed ice prticles, said fractured ice particles being forcibly urged in a generally radial outward direction by said blade-like member and further being discharged from between said freezer surface and said ice breaker as said ice breaker is rotated, and compression means fixed relative to said freezer plate generally at said radially peripheral position thereon for compressing quantities of said fractured ice particles as said ice particles are discharged from between said freezer surface and said ice breaker in order to remove unfrozen water from said ice particles.

4,527,402
PROGRAM-CONTROLLED KNITTING MACHINE, METHOD AND PRODUCTS THEREOF

Roger T. Swallow, Asheboro; William R. Jackson, Raleigh, and Jack D. Pierce, Asheboro, all of N.C., assignors to Rampon Products, Inc., Asheboro, N.C.

Filed Sep. 29, 1982, Ser. No. 427,911
Int. Cl.³ D04B *9/46;* **G06G** *7/64;* **A41F** *13/00;* **A41B** *11/00*
U.S. Cl. 66—55 **22 Claims**



1. A method of making a tubular garment fabric forming the entire or some portion of a garment conforming to a selected part of the body such as the leg and in which the fabric is desired to assert some predetermined degree of compression at selected locations along the length thereof and with graduated and controlled changes in such compression between such locations, comprising the steps of:

(a) knitting on a circular knitting machine having a complement of cooperable knitting elements a series of sample tubular fabrics in which from sample to sample a change is made in the setting of the knitting elements of the machine such that the limp and stretch circumferences and corresponding compression characteristics are changed from sample to sample in correspondence with the machine settings;

(b) measuring the stretch-compression characteristics of each sample at each of a plurality of stretch positions and storing such measurements together with the corresponding machine settings for each such sample as first memory data;

(c) measuring the actual circumference at each of some predetermined number of locations along the length of the part of the body on which the tubular garment fabric is to be worn and storing the circumferential measurements thereby obtained together with the compression pressure desired at selected said locations as second memory data;

(d) operating on said first and second memory data with program means and producing therefrom third memory data representing a set of settings for said machine capable of producing a finished tubular garment fabric suited to the anatomic form of said selected part of the body and exhibiting compression characteristics at each of said selected locations thereon substantially equal to the said desired compression pressures and program determined machine settings corresponding to graduated pressures between said selected locations; and

(e) operating said machine under program control utilizing said third memory data through control means on said machine adapted to control said selected machine settings under signal control established by said third memory data in timed relation to the operation of said machine whereby to produce a said finished tubular garment fabric having said compression pressures at said selected locations and said graduated pressures therebetween.

22. A program method of selecting a new tubular fabric garment to be worn on a selected part of the body by a selected individual and requiring a desired compression profile, comprising:

(a) determining and storing in memory first information representative of the pressure profile characteristics of a plurality of previously-made, tubular fabric garments corresponding to a range of body contours for the portion of the body on which the garment is to be worn and a range of pressure profiles for such contours; and

(b) determining and storing other second information in memory representative of the contour of said individuals selected part of the body and desired compression profile; and

(c) comparing said first and second information to select the previously-made garment closest in pressure profile to said new garment pressure profile.

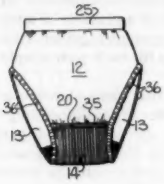
4,527,403
CIRCULAR KNIT PANTY AND METHOD

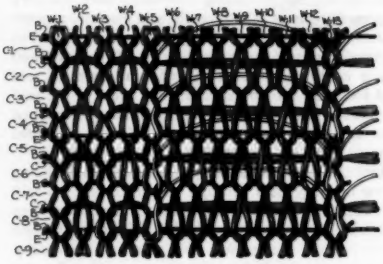
Olen E. Fullbright, Connellys Spring; Truette H. Baird, Valdese, and Jack H. Wade, Morganton, all of N.C., assignors to Hosiery Maufacturing Corp. of Morganton, Morganton, N.C.

Filed Aug. 6, 1984, Ser. No. 638,294
Int. Cl.³ A41B *9/00;* **D04B** *9/12, 9/18*
U.S. Cl. 66—177 **8 Claims**

1. A knit panty comprising a front panel including opposite side edges with successive courses extending between said opposite side edges and including adjacent wales of stitch loops, a rear panel including opposite side edges with successive courses extending between said side edges and including adjacent wales of stitch loops, identical inwardly turned welts on one end of each of said front and rear panels, side seams connecting corresponding portions of said opposite sides of said front and rear panels adjacent said inwardly turned welts and forming a body portion with an upper waist opening defined by said identical inwardly turned welts on the corresponding ends of said front and rear panels, a crotch area extending between and interconnecting said front and rear panels, said crotch area including mock ribs having elastic yarn incorporated in spaced-apart wales and floating inside of the

wales between said spaced-apart wales to provide greater coursewise stretchability and greater fabric density in said





crotch area than the coursewise stretchability and fabric density of said front and rear panels.

4,527,404

WARP-KNITTED LACE STRIP

Noboru Nakagaki, 701, Kurimorichohama, Fukui City, Fukui, Prefecture, and Yoyu Fujikawa, 402, Enzan 1-Chome, Fukui City, Fukui, Prefecture, both of Japan

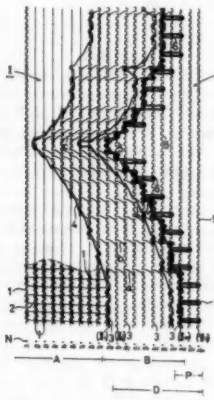
Continuation of Ser. No. 337,166, Jan. 5, 1982, , which is a division of Ser. No. 81,067, Oct. 29, 1979, Pat. No. 4,307,496.

This application Feb. 14, 1984, Ser. No. 578,619

Claims priority, application Japan, Feb. 19, 1979, 54-18600; Feb. 19, 1979, 54-18601; Mar. 15, 1979, 54-30769; Mar. 15, 1979, 54-30770; Mar. 22, 1979, 54-34018

Int. Cl.[3] D04B *7/16*

U.S. Cl. 66—202 **9 Claims**



1. A warp-knit fabric comprising a plurality of interconnected lace sections of insoluble yarns, each having at least one scallop edge, adjacent sections being interconnected by an insoluble draw thread and at least one soluble yarn adjacent each draw thread, and said sections being separable from one another upon dissolution of said soluble yarns and removal of said draw threads.

4,527,405

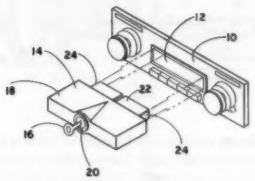
SECURITY LOCK FOR CASSETTE RECORDERS AND CASSETTE PLAYERS OR THEFT DISCOURAGEMENT DEVICE FOR CASSETTE RECORDERS AND CASSETTE PLAYERS

William A. Renick, 1025 Sumac Dr., Sunnyvale, Calif. 94086, and Donald W. Sutter, 6392 Farm Hill Way, San Jose, Calif. 95120

Filed Apr. 25, 1983, Ser. No. 488,385

Int. Cl.[3] E05B *73/00*

U.S. Cl. 70—14 **3 Claims**



1. A locking device for preventing use of a cassette player or the like and thereby discouraging theft thereof, comprising:

body means having an exterior portion of dimensions large enough to prevent such portion from entering the cassette receiving opening of a cassette player, and an interior portion having dimensions suitable to allow same to enter the cassette receiving opening;

cam means disposed within said interior portion and adapted to expand outwardly to engage an interior wall of said cassette opening;

lock means disposed within said exterior portion; and

actuating means coupling said lock means to said cam means for driving said cam means from a retracted position to an extended position, said actuating means including a screw and nut drive means coupled to a rotatable part of said lock means and adapted to move said cam means between said retracted position and said extended position as said lock means is changed from an unlocked configuration to a locked configuration, said screw being affixed to a bar means disposed in a slot formed in said interior portion and extending transversely relative to the axis of said screw with the distal ends of said bar means being pivotally attached to said cam means and wherein the nut of said nut drive means is affixed to the rotatable cylinder of a key lock forming said lock means.

4,527,406

LOCKING FUEL CAP

Steven F. Baker, Bellevue, Ohio, assignor to General Motors Corporation, Detroit, Mich.

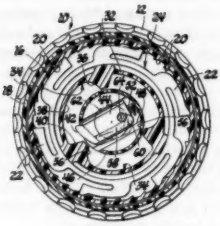
Filed Apr. 28, 1983, Ser. No. 489,695

Int. Cl.[3] B65D *55/14*

U.S. Cl. 70—165 **1 Claim**

1. An improvement in key operated torque limited locking fuel caps for use in closing a fuel fill tube having a cap handle, a cap closure, a ratchet ring operatively connected to the closure, and a lock and key mechanism mounted in the fuel cap including a lock cylinder wherein when the lock cylinder is conditioned to the locking mode, the key can be removed from the lock cylinder prior to removal or installation of the fuel cap onto the fill tube, said fuel cap being torque limited in the closing direction and the lock mechanism providing a positive drive connection between the cap handle and ratchet ring in the opening direction when unlocked and a slipping connec-

tion therebetween in the opening direction when locked, wherein the improvement comprises an arcuate cam race formed on the ratchet ring, a spring biased transversely movable lock bolt drivingly connected to the cap handle and including cam follower means engageable with said cam race to provide a positive drive connection between said cap handle and said ratchet ring in both directions of rotation when the lock mechanism is unlocked, and spring finger means having one end integral with said lock bolt and the other end having



a latch portion engageable with a portion of the lock cylinder to maintain the lock bolt in a position to interrupt the drive connection in the opening direction thus preventing unauthorized cap removal, said lock bolt being movable transversely of the cap by said cam race in the cap closing direction to enforce engagement of the latch portion of said spring finger with said lock cylinder only when said lock mechanism is locked, said cam race being designed to always establish a positive drive with the lock bolt in the closing direction.

4,527,407

FUEL TANK LOCKING APPARATUS

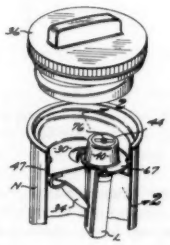
Donald J. Shanklin, Fullerton, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Division of Ser. No. 106,396, Dec. 26, 1979, Pat. No. 4,362,036. This application Sep. 2, 1982, Ser. No. 414,457

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.³ B65D *51/18, 55/14*

U.S. Cl. 70—167 **6 Claims**



1. A fuel tank lock for use with a conventional filler neck having a baffle plate formed with an oval-shaped constricted passage that normally closed by a biased-shut valve member carried by said baffle plate that is forced open when engaged by an unleaded fuel nozzle of smaller transverse cross-section than said constricted passage, with the upper end of said filler neck being provided with a conventional fuel tank cap, said lock comprising:

a body provided with a key-operated locking mechanism in its upper protion and a shank that extends through said constricted passage;

collar means on said body larger than said constricted passage that rest upon the upper surface of said baffle plate to support said body thereupon;

latch means operatively associated with said body shank movable between a locked position wherein part of said latch means extend transversely of the underside of said baffle plate outwardly of said constricted passage and an unlocked position disposed inwardly of said passage to permit withdrawal of said shank from said passage, with said latch means being actuated by said locking mechanism; and

an oval-shaped boss formed on said body which complementarily fits within said constricted passage to prevent rotation of said body within said passage relative to said baffle plate as said key-operated locking mechanism is actuated.

4,527,408

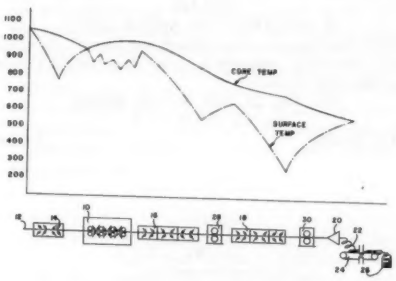
METHOD AND APPARATUS FOR COOLING AND HANDLING HOT ROLLED STEEL ROD IN DIRECT SEQUENCE WITH A HIGH SPEED ROLLING OPERATION

Asjed A. Jalil, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Oct. 31, 1983, Ser. No. 547,087

Int. Cl.³ B21B *45/02;* **C21D** *9/52*

U.S. Cl. 72—201 **10 Claims**



1. In a method of rolling steel rod in a rolling mill wherein said steel rod ranging from about 4.0 to 8.0 mm. in diameter exits from a mill finishing train at mill delivery speeds of at least about 75 m./sec., and the thus rolled rod is directed at said mill delivery speeds through liquid cooling devices to a laying head which forms the rod into rings, the improvement comprising:

(a) preliminarily applying liquid coolant to the rod prior to its exiting from the mill finishing train, the said preliminary application being sufficient to lower the surface temperature of the rod exiting from the mill finishing train to less than about 950° C. with an accompanying increase in the column strength thereof;

(b) operating said liquid cooling devices to lower the surface temperature of the rod to below 400° C. before the rod arrives at the laying head; and

(c) applying a tractive force to the rod at at least one location between the mill finishing train and the laying head, the increase in rod column strength resulting from the aforesaid preliminary application of liquid coolant acting in concert with the said application of tractive force to insure that the rod has sufficient rigidity and forward momentum to pass from the finishing train through the liquid cooling devices and to and through the laying head.

4,527,409
PROCESS OF HOT-ROLLING STEEL USING A HEAT-REFLECTING SCREEN

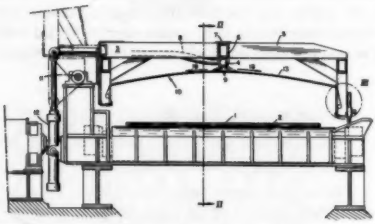
Johannes H. W. Ouwerkerk, Driehuis, Netherlands, assignor to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Jan. 20, 1983, Ser. No. 459,679

Claims priority, application Netherlands, Jan. 26, 1982, 8200265

Int. Cl.³ B21B *43/00, 45/02*

U.S. Cl. 72—202 **5 Claims**



1. A process for hot-rolling steel utilizing a heat-reflecting screen having a radiant heat-reflecting surface facing the work comprising passing the work beneath the screen, flowing fluid coolant in heat-exchange relationship with said surface and maintaining the temperature of said heat-reflecting surface above the dew point of the atmosphere in contact with it.

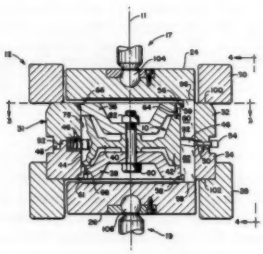
4,527,410
BLADE TWISTING APPARATUS

Donald G. MacNitt, Jr., Singer Island, and Larry N. Fuss, Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,451

Int. Cl.³ B21D *53/78*

U.S. Cl. 72—306 **6 Claims**



1. Apparatus for increasing the twist of blades of an integrally bladed rotor from a first to a second degree of twist, the rotor comprising a disk having an axis and a rim, a plurality of blades extending radially outwardly from the rim and integral therewith, the blades having a base, a tip, a pressure surface, and a suction surface, said apparatus comprising:

first guide means disposed about an axis defining a plurality of first axially extending guide channels disposed on one side of the blades to be twisted;

second guide means disposed coaxially with said first guide means defining a plurality of second axially extending guide channels disposed on the other side of the blades to be twisted;

fixture means for holding an integrally bladed rotor stationary and in position between said first and second guide means and fixed relative to said guide means;

a pair of complementary blade forming means corresponding to each blade to be twisted, a first one of each pair being disposed in one of said first guide channels for sliding movement in an axial direction within said first guide channel between a first and second position toward the suction side of its corresponding blade and having a forming end adapted to continuously contact said blade suction surface during said movement, said forming end further having a surface substantially the contour of the blade suction surface in its desired second degree of twist configurations, said end surface adapted to be substantially contiguous with said suction surface when said forming means is in said second position;

the second one of each pair of blade forming means being disposed in one of said second guide channels for sliding movement in an axial direction within said first guide channel between a first and second position toward the pressure side of its corresponding blade and having a forming end adapted to continuously contact said blade pressure surface during said movement, said forming end further having a surface substantially the contour of the blade pressure surface in its desired second degree of twist configuration, said end surface adapted to be substantially contiguous with said pressure surface when said forming means is in said second position; and

press means disposed adjacent said blade forming means for simultaneously moving said pairs of blade forming means from their first to second position.

4,527,411
PROCESS FOR PRODUCING WALKING BAR MEMBERS FOR CONTINUOUS CASTING

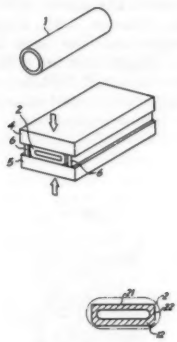
Akira Shinosaki, and Shinji Amako, both of Hirakata, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Dec. 30, 1982, Ser. No. 454,648

Claims priority, application Japan, Jan. 22, 1982, 57-9285

Int. Cl.³ B21D *51/16, 28/00;* **B23P** *13/00*

U.S. Cl. 72—340 **10 Claims**



1. A process for producing a walking bar for continuous casting made of steel alloy of low weldability in the form of a flat tube having upper and lower opposed flat surfaces and a hollow interior over the entire length thereof, comprising:

heating a tubular metal blank at a temperature of 550° to 1250° C;

placing the heated blank between an upper die and a lower die of a press machine wherein a spacer having a height equal to a predetermined dimension to which the blank is to be compressed minus an amount of elastic restoration of the blank is placed between the upper die and the lower die;

moving the upper and lower die toward the other to a position where the dies are spaced apart by the height of the spacer compressing the heated blank on upper and lower surfaces thereof over the entire length thereof by compressive plastic working which achieves a working ratio

of up to 65% pressing the blank into the flat tubular body with the upper and lower dies for a predetermined time period over the entire length of the blank; and

machining at least one entire planar surface of the tubular body so as to smooth said surface, form a substantially planar surface, and reduce the wall thickness thereof between a hollow interior thereof and said smooth surface so as to increase a cooling effect of the wall, the thickness of which has been so reduced;

said working ratio being represented by $(D-H/D\times 100$ wherein D is the outside diameter of the blank before the plastic working and H is the minor outer diameter of the tubular body after the plastic working; and

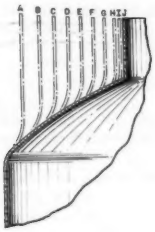
minor side walls of said tubular body having a larger wall thickness than a major upper wall thereof which is machined and is made thinner.

4,527,412

METHOD FOR MAKING A NECKED CONTAINER

Hans F. Stoffel, Rye, N.Y.; William T. Saunders, Weirton, W. Va., and Anthony J. Sporri, Tallapoosa, Ga., assignors to Stoffel Technologies, Inc., Tuckahoe, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,190
Int. Cl.³ B21B *22/00*
U.S. Cl. 72—349 **14 Claims**



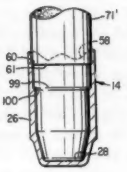
1. A method of making a necked tubular member comprising the steps of forming a sheet of material into a generally cylindrical tubular member and welding the adjacent longitudinally extending edges of the sheet, arranging said welded tubular member about a mandrel having a free end portion with a dome-shaped surface, performing a plurality of necking-in operations on said welded tubular member while said member is arranged about said mandrel to progressively reduce the diameter of a free end portion of the tubular member at least 15% from the original diameter of said tubular member with the necked-in end of the tubular member having a dome-shaped configuration, said plurality of necking-in operations including a first necking-in operation of reducing the diameter of the free end portion of the tubular member and forming an intermediate portion between said reduced diameter free end portion and the remainder of the tubular member over a portion of said dome-shaped surface of said mandrel and a further necking-in operation of further reducing the diameter of the free end portion of the tubular member and further forming said intermediate portion over said dome-shaped surface of said mandrel to increase the extent of said intermediate portion.

4,527,413

APPARATUS FOR DRAWING HEAVY WALL SHELLS WITH A MULTI-STEP INSIDE EDGE

John D. Budrean, DeMotte, Ind., and John A. Kirkpatrick, Chicago Heights, Ill., assignors to Verson Allsteel Press Company, Chicago, Ill.

Continuation-in-part of Ser. No. 408,015, Aug. 13, 1982,. This application Sep. 23, 1983, Ser. No. 535,064
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **17 Claims**



1. An apparatus for forming a material into a part having side walls, comprising:

a first step forming stage of forming having a first draw die and a first cooperating draw punch to draw the material through said first draw die to form the material, said first draw punch having a primary draw shoulder for forming a step on the side walls of the part at an angle to the axis of the formed part; and

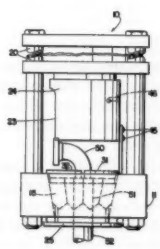
a second and subsequent stage of forming including a second draw die and a second cooperating draw punch to draw the material and reduce the diameter and increase the length thereof, said second draw punch having a primary draw shoulder for mating with the primary step formed in said first stage of forming and a secondary shoulder for forming a second step on the side walls of the part at an angle to the axis of the formed part, said secondary step formed prior to the primary draw shoulder of said draw punch mating with said primary step.

4,527,414

CRIMPING MACHINE WITH SPLIT DIE RING

Paul J. Jurkovic, Euclid, and George C. Burrington, Eastlake, both of Ohio, assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Nov. 1, 1983, Ser. No. 547,706
Int. Cl.³ B21D *41/04*
U.S. Cl. 72—402 **8 Claims**



1. Apparatus for radially crimping the collar of a hose coupling onto a hose end comprising

a base plate,

a hydraulic actuator,

means supporting said actuator for axial movement toward and away from said base plate, said base plate having a tapered opening therein,

a plurality of die segments received in said opening,

a resiliently mounted die separator also received in said opening, said die separator supporting said die segments in a circular array and adapted for axial movement,

a pusher member on said hydraulic actuator for transmitting movement of said hydraulic actuator to said die segments for axially urging said die segments toward the narrow end of said tapered opening to cause radial contraction thereof,

a die ring interposed between said pusher member and said die segments for transmitting movement of said pusher member to all of said die segments to assure simultaneous movement of said die segments, said die ring being split into separable parts to facilitate loading and unloading of said hose coupling in said die segments,

engagement means on said die ring for limiting axial movement of said die ring and said pusher thereby to limit radial inward contraction of said die segments, and

means for securing said separable parts of said die ring in a generally circular configuration to assure contact with all of said die segments, said securing means comprising a ridge on said separable parts for engagement with said die segments, said ridge being arcuate and adapted for receipt within said tapered opening.

4,527,415

APPARATUS FOR CHECKING THE SET PRESSURE OF A SAFETY VALVE

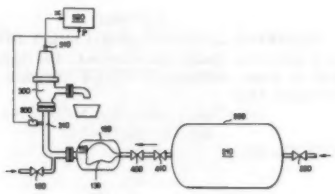
Jean Chabat-Courrède, Moret S. Loing, France, assignor to Electricite de France (Service National), Paris, France

Filed Oct. 28, 1983, Ser. No. 546,504

Claims priority, application France, Nov. 10, 1982, 82 18880

Int. Cl.³ G01L *27/00*

U.S. Cl. 73—4 R **6 Claims**



1. Apparatus for measuring the set pressure of a safety valve having inlet tubing and a valve plate which is displaced whenever the fluid pressure in said inlet tubing is greater than said set pressure, wherein the apparatus comprises said safety valve being in combination with:

a first tank filled with a first fluid at a pressure less than the set pressure to be checked, and connected to the fluid inlet tubing of the safety valve to be checked;

a second tank filled with a second fluid at a pressure greater than said set pressure;

rapid communication means for rapidly putting said first and second tanks into fluid pressure communication with each other;

means connected to the valve to be checked, to measure both the pressure in said fluid inlet tubing and the displacement of said valve plate simultaneously; and means for isolating said first fluid from said second fluid, while the tanks are in fluid pressure communication with each other.

4,527,416

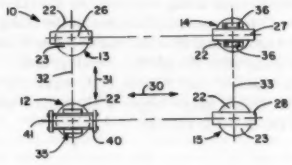
VEHICLE RESTRAINT SYSTEM

Steven R. Haeg, Shorewood, and Michael G. LaCroix, Eden Prairie, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Feb. 28, 1984, Ser. No. 584,462

Int. Cl.³ G01M *17/04*

U.S. Cl. 73—11 **7 Claims**



1. In a test system for testing vehicles which have a plurality of at least three wheels including a plurality of generally upright actuators operable for displacement in vertical directions, and having wheel supports for each of said vehicle wheels, each of said supports having a generally planar upper surface on which a wheel will rest, the improvement comprising a restraint system including first means on a support supporting one of the vehicle wheels restraining lateral motion and fore and aft motion of such vehicle wheel relative to the associated wheel support and second means on a diagonally located wheel of the same vehicle which restrains only lateral movement of said diagonally located wheel.

4,527,417

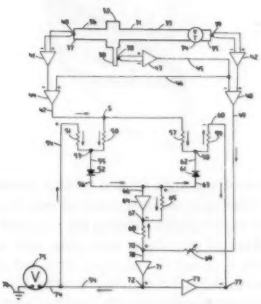
APPARATUS USEFUL FOR RAPIDLY DETERMINING THE MOLECULAR WEIGHT OF A FLOWING GASEOUS MATERIAL

Milton F. Pravda, 7708 Greenview Terr., Towson, Md. 21204

Filed Mar. 13, 1984, Ser. No. 589,020

Int. Cl.³ G01N *25/00*

U.S. Cl. 73—23 **3 Claims**



1. Apparatus for determining the molecular weight of a flowing gas stream comprising in combination

a vortex tube having an inlet for said stream, a vortex generation chamber for receiving the stream and separating it into a cold fraction and a hot fraction, and an outlet for each said fraction through which it exits from the tube as a stream,

temperature-sensing means disposable in each stream for sensing the temperature thereof and coincidentally therewith producing an e.m.f. related thereto,

said e.m.f.'s being designated E_c, E_i, and E_h, and being respectively produced in said cold, inlet, and hot streams,

differential means for receiving each of said e.m.f.'s; the first

of said means receiving the E_c and E_i signals and the second said means receiving the E_h and E_i signals,

said first differential means producing an output signal, designated $E_i - E_c$, representing the difference between said two inputs thereto,

said second differential means producing an output signal, designated $E_h - E_h$, representing the difference between said two inputs thereto,

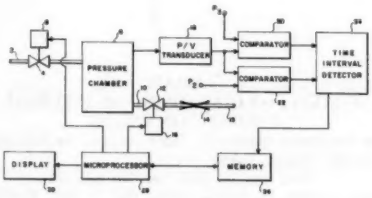
analog divider means for receiving output signals from said first and second differential means and forming a positive quotient signal therewith,

and connecting means for transmitting said positive quotient signal from said analog divider means to a voltage sensing means having means relating said positive quotient signal to the molecular weight of said inlet gas.

4,527,418
METHOD OF MEASURING SPECIFIC GRAVITY AND APPARATUS UTILIZING THE SAME

Samuel A. Arcara, Doylestown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 9, 1984, Ser. No. 578,736
Int. Cl.³ G01N *9/32*
U.S. Cl. 73—30 **12 Claims**



1. A method for measuring the specific gravity of a pressurized fluid including the steps of

pressurizing a fixed volume chamber by the fluid to be analyzed to a first pressure level,

allowing the pressure in the chamber to decay through a fixed restriction,

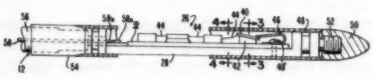
measuring the decay time of the pressure between preset second and third pressure limits lower than the first pressure level and

converting the decay time into the specific gravity of the fluid to be analyzed.

4,527,419
SENSOR FOR UNDERGROUND DUCT PROBE

John Dimeff, and Clyde R. Stewart, both of San Jose, Calif., assignors to Mark Telephone Products, Inc., Santa Clara, Calif.

Filed May 23, 1983, Ser. No. 497,314
Int. Cl.³ G01M *3/24*
U.S. Cl. 73—40.5 A **9 Claims**

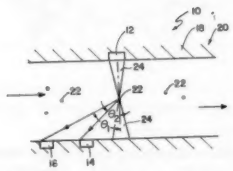


1. A sensor for an underground duct probe containing a current-carrying cable, the probe being adapted to be inserted in an underground duct of the type containing an underground cable, the sensor comprising: a base; means mounted on the base for generating an electrical signal in response to a particular operating condition of the underground cable when the sensor is in the underground duct adjacent to the cable; and a cover over the signal generating means, the cover having a cylindrical inner surface and being of a material permitting the signal generating means to be responsive to the condition when the sensor is adjacent to the cable, said base having means for removably mounting the same on a carrier rod for inserting the sensor into the underground duct; the signal generating means including a crystal having an edge circumscribing at least a portion of the crystal, and means mounting the crystal on the base in a manner that biases at least a portion of said edge in contact with the inner surface of the cover.

4,527,420
ULTRASONIC PARTICULATE SENSING

Kenneth G. Foote, Laksevaag, Norway, assignor to Micro Pure Systems, Inc., Warwick, R.I.

Filed Jun. 11, 1982, Ser. No. 387,741
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—61 R **8 Claims**



1. A method of identifying particulates in a flow comprising:

sending an ultrasonic pulse of known energy into the flow,

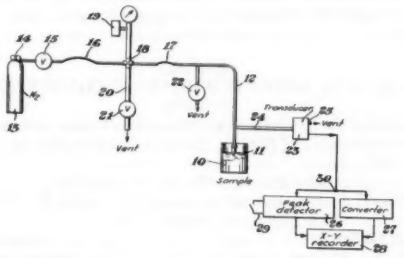
detecting at a preselected angle energy scattered when the pulse strikes a particulate in the flow, and

using the amount of detected scattered energy in relation to the known energy of the pulse and the angle of its detection to identify the particulate.

4,527,421
DYNAMIC SURFACE TENSIOMETRY AND METHOD

Theodore E. Miller, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 13, 1984, Ser. No. 570,331
Int. Cl.³ G01N *13/02*
U.S. Cl. 73—64.4 **11 Claims**



1. Apparatus for measuring dynamic surface tension at a gas-liquid interface by the maximum bubble-pressure method comprising

a bubble orifice tube adapted to be immersed in the liquid at a predetermined depth;

automatic means for delivering the gas to the orifice tube at a rate rising continually over an interval of time to increase the frequency of bubble formation at least several fold; and

automatic means for measuring the maximum bubble pres-

sure throughout the interval, each such pressure being a function of the surface tension.

4,527,422

APPARATUS FOR DETERMINING THE VALUE OF A CYCLICALLY VARYING PARAMETER OF AN INTERNAL COMBUSTION ENGINE

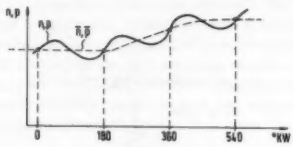
Günter Hönig, Ditzingen; Günther Kaiser, Stuttgart; Gerhard Lotterbach, Markgröningen, and Udo Zucker, Güglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 15, 1983, Ser. No. 504,525

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223328

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117.3 **19 Claims**



1. Apparatus for determing the average value of a parameter having a periodically or cyclically varying parameter component in a piston-type internal combustion engine (ICE) operating in cycles having

sensing means (12) for sensing an operating parameter of the engine and providin a varying sensed output signal representative of the cyclically varying parameter;

an output circuit (16);

means (14) for providing a reading signal;

and controlled switch means (13) controlled by said reading signal selectively connecting the sensing means (12) to the output circuit (16),

wherein, in accordance with the invention,

the means (14) for providing the reading signal is coupled to the crankshaft of the engine for providing, at each cycle of operation of the engine, a single reading signal,

said signal providing means (14) furnishing said signal at a predetermined angular positon of the crankshaft of the engine with respect to a reference (TDC) position of a reference piston of the engine;

and the output circuit (16) provides an output signal representative of the value of the time-average of the sensed signals and is coupled to the signal providing means (14).

4,527,423

AIR FLOW METER FOR INTERNAL-COMBUSTION ENGINE

Kanemasa Sato; Sadayasu Ueno; Yoshishige Oyama, and Yutaka Nishimura, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,556

Claims priority, application Japan, Feb. 8, 1982, 57-17511

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **13 Claims**

1. An air flow meter for an internal combustion engine having:

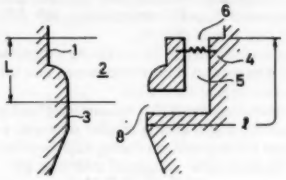
a main passage provided between an air cleaner and the internal-combustion engine;

a venturi provided in said main passage;

a by-pass passage having an inlet from which a part of the air flowing through said main passage flows as well as an outlet provided at said venturi from which said part of the air flows out to said main passage; and

a flow sensor provided in said by-pass passage for measuring the flow rate of the air flowing through said by-pass passage,

wherein the inlet opens parallel to longitudinal axis of said main passage and the outlet is located downstream of the flow sensor and said by-pass passage has a length relative to said main passage corresponding to said by-pass passage



such that an average flow rate in the by-pass passage is increased so as to cancel a decrease in an output of the flow meter in regions wherein an intake pulsation is generated.

4,527,424

SYSTEM FOR DIAGNOSING AN INTERNAL COMBUSTION ENGINE

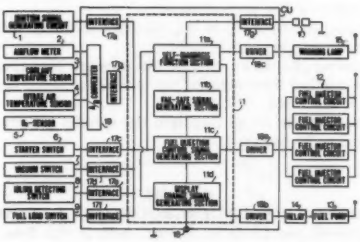
Toshio Takahashi, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,492

Claims priority, application Japan, Oct. 1, 1982, 57-173622

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **6 Claims**



1. A system for diagnosing an internal combustion engine, comprising

a control signal generating system for monitoring the operation of said engine and for generating a control signal;

a driven system operated in dependency on said control signal;

a first diagnosis circuit for diagnosing the operation of said control signal generating system and for producing an output when trouble occurs in the control signal generating system;

a second diagnosis circuit for diagnosing the operation of said driven system and for producing an output when trouble occurs in the driven system;

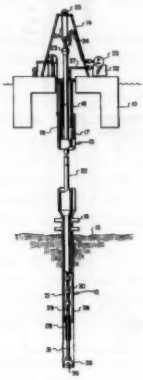
indicator means for indicating results of diagnoses by said first and second diagnosis circuits; and

gate means controlled by the output of said first diagnosis circuit so that the indicator means for said second diagnosis circuit does not indicate trouble in said driven system.

4,527,425
SYSTEM FOR DETECTING BLOW OUT AND LOST CIRCULATION IN A BOREHOLE

James G. Stockton, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,531
Int. Cl.[3] E21B *47/10*; G01F *1/66*
U.S. Cl. 73—155 23 Claims



1. A method of detecting the commencement of blowouts and lost circulation in a borehole in which a drilling fluid is being circulated, comprising the steps of:

transducing at a selected location within the borehole the rate of flow of the drilling fluid into the borehole into a first electrical signal proportional thereto;

accumulating said first electrical signals over a selected interval of time;

transducing, at said selected location within the borehole, the rate of flow of the drilling fluid out of the borehole into a second electrical signal proportional thereto;

accumulating said second electrical signals over a selected interval of time;

comparing the accumulation of said first electrical signals with the accumulation of said second electrical signals to determine the differences in value therebetween, a preselected difference between the compared values being indicative of the commencement of one of a blow out and lost circulation, wherein said transducing steps comprise generating at a selected point within the borehole a sonic signal within the flowing streams of drilling fluid;

receiving the sonic signals at a first point located a selected distance above said selected point and at a second point located the same selected distance below said selected point;

measuring the time difference between reception of the sonic signal at said first and second points in the incoming fluid stream and transducing said first electrical signal in proportion thereto and in the outgoing fluid stream and transducing said second electrical signal in proportion thereto, and wherein said measuring step comprises triggering the generation of a ramp function simultaneously with the generation of said first sonic signal;

accumulating the value of said ramp function in response to reception of said first sonic signal at said first point and accumulating the value of said ramp function in response to reception of said first sonic signal at said second point;

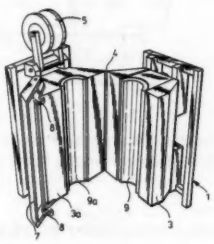
comparing the value of said ramp functions after accumulation of each; and

producing a first time difference signal proportional to the difference in the compared values of said accumulated ramp function values.

4,527,426
SYSTEM FOR CENTERING AN ELONGATED OBJECT WITHIN A HOUSING

John G. Lang, Scarborough, Canada, assignor to Rotesco Inc., Ontario, Canada

Filed May 31, 1983, Ser. No. 499,541
Int. Cl.[3] G01L *5/04*
U.S. Cl. 73—158 13 Claims



1. Apparatus for centering an object within a housing, said apparatus comprising first and second spaced apart adjustable jaw arrangements aligned in the housing, adjustment means for adjusting opening and closing of said jaw arrangements each of which comprises first and second jaw members located to either side of the object, said first jaw member being interconnected with said adjustment means and said second jaw member being separate from said first jaw member in each jaw arrangement and movement transfer means including a pivotal member in each jaw arrangement for transferring movement from said first jaw member to said second jaw member in a manner such that said jaw members move in opposing directions to open and close substantially simultaneously with one another, spring means for pressurizing said movement transfer means for maintaining contact between said movement transfer means and said first jaw member during opening thereof to provide automatic opening of said second jaw member during adjusted opening of said first jaw member, and first and second connecting means for connecting said first and second jaw arrangements respectively to said adjustment means such that a single adjustment of said adjustment means provides substantially simultaneous and corresponding adjustment of each of said first and second jaw arrangements, said first and second connecting means being threadably engaged with said adjustment means through opposite ends thereof to form a turnbuckle structure for threaded adjustment of said jaw arrangements.

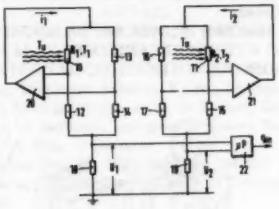
4,527,427
DEVICE FOR DETERMINING THE FLOW RATE OF A FLOWING MEDIUM

Werner Grünwald, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,893
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304902
Int. Cl.[3] G01F *1/68*
U.S. Cl. 73—204 2 Claims

1. In a device for determining the flow rate of a flowing medium aspirated by an internal combustion engine, having at least two temperature-dependent measuring resistors exposed to said flowing medium, each disposed in a bridge circuit, heated to different temperatures, and regulated such as to be constant via a regulating means, and in which one signal per bridge, dependent on the currents flowing through said bridges, is supplied to a signal processing unit, the output variable of which represents a standard for said flow rate of the medium

that is independent of the temperature of the flowing medium, characterized in that said two temperature-dependent measuring resistors comprise film resistors disposed opposite one another, each on a different side of a substrate member.

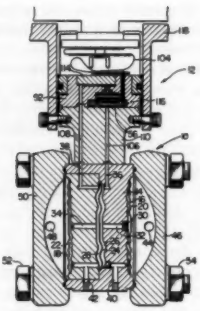


4,527,428

SEMICONDUCTOR PRESSURE TRANSDUCER

Satoshi Shimada; Kazuji Yamada, both of Hitachi; Seikou Suzuki, Hitachiota; Shigeyuki Kobori, Hitachi, and Motohisa Nishihara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 442,665
Int. Cl.³ G01L *9/06*
U.S. Cl. 73—721 **16 Claims**



1. A semiconductor pressure transducer comprising:
a measuring diaphragm formed of semiconductor material;
a support member formed of semiconductor material for supporting said measuring diaphragm;
an oxide layer having a high affinity to glass and a thin glass layer interposed between said measuring diaphragm and said support member, said oxide layer enabling said thin glass layer of uniform thickness to be formed, said measuring diaphragm and said support member being joined to each other by anodic bonding through said thin glass layer;
a main body on which said support member is mounted; and
means located in said main body for applying pressures of fluids to be measured to said measuring diaphragm.

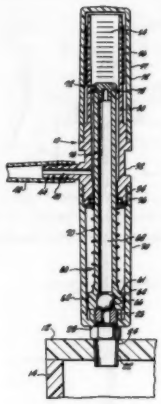
4,527,429

PRESSURE INDICATOR

H. E. Buddy Combest, and Larry M. Tunks, both of Huntington Beach, Calif., assignors to Aladdin Equipment Company, Huntington Beach, Calif.

Filed Dec. 21, 1983, Ser. No. 564,469
Int. Cl.³ G01L *7/16*
U.S. Cl. 73—744 **8 Claims**

1. A pressure gauge for use with a swimming pool filter system or the like, the pressure gauge comprising:
a housing;
hollow piston means disposed within the housing and movable from a first position to a second position;
spring means disposed within the housing to bias the piston means into the first position;



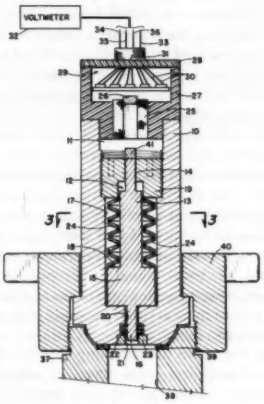
means for relieving high pressure gas within the filter system, the relieving means integral with the housing;
ball bearing means adapted to seal the piston means to occasion movement of the piston means in accordance with the pressure in the filter system from the first position to the second position to indicate pressure in the filter system.

4,527,430

TRANSDUCER APPARATUS FOR MEASURING PRESSURE OF FLUIDS

Joel M. Leathers, Jones Creek, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1983, Ser. No. 548,268
Int. Cl.³ G01L *7/16, 9/10*
U.S. Cl. 73—745 **6 Claims**



1. A transducer apparatus for measuring the pressure of a moving fluid stream, the apparatus comprising:
a body member having a lengthwise cylindrical bore therein and a pressure orifice in communication with said bore;

a piston defined by an integral cylindrical structure which includes a rod segment, a first stem segment which extends from one end of the rod segment, a base segment at the opposite end of the rod segment, and a second stem segment which extends from the base segment;

the rod segment has a smaller diameter than the body bore, to define an annulus section between the rod segment and the bore, the base segment has a larger diameter than the rod segment, and said base segment is slidable within the body bore;

a guide plug having a guide passage therein is fastened into the body bore ahead of the piston, the first stem segment is slidable within the guide plug passage, and the second stem segment is slidable within the pressure orifice;

a linear spring means is carried on the rod segment of the piston, and is positioned within the annulus section;

a sensor unit which includes a magnetometer positioned ahead of the first stem segment of the piston, and a rectifier circuit in proximity to the magnetometer;

a pressure indicator means which connects into the rectifier circuit, for visually indicating pressure values;

the body member is adapted for mounting on a structure designed to carry a fluid under pressure, the mounting arrangement being such that the pressure orifice is in direct communication with the pressurized fluid; and wherein

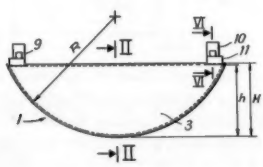
a change in the fluid pressure causes the first stem segment of the piston to move toward or away from the magnetometer, the magnetometer produces an output voltage which is converted by the rectifier circuit into an electrical signal, and the signal is picked up by the indicator means and displayed as units of pressure.

4,527,431

ULTRA-FLAT PRESSURE PLATE MATERIAL TESTER AND METHOD FOR ITS MANUFACTURE

Charles S. Abdunur, Paris, France, assignor to Etat Francais représenté par le Ministere de l'Urganisme et du Logement Laboratoire Central des Ponts et Chaussees, France

Filed Aug. 22, 1983, Ser. No. 525,313
Claims priority, application France, Aug. 27, 1982, 82 14746
Int. Cl.³ G01N *3/10*
U.S. Cl. 73—803 **6 Claims**



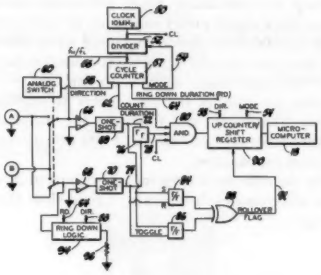
1. Ultra-flat pressure plate material tester, comprising a chamber capable of being placed under pressure, said chamber being defined by two facing side plates shaped as circular segments with a rectilinear edge and a circular edge, and by a rectilinear obturator joining the rectilinear edges of the side plates, the circular edges of the side plates being turned back towards one another by more than 90° and assembled to one another to close said chamber.

4,527,432

DUAL FREQUENCY ACOUSTIC FLUID FLOW METHOD AND APPARATUS

Jeffrey S. Gutterman, Hilton, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1983, Ser. No. 548,994
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.28 **6 Claims**



1. In an acoustic flow meter having a pair of acoustic transducers spaced along a fluid flow stream to define an acoustic path length of many acoustic wavelengths, the method of measuring fluid flow comprising the steps of:

alternately energizing the transducers to effect upstream and downstream propagation of acoustic waves,

measuring the number of wavelengths in the acoustic path for upstream propagation with sufficient accuracy to determine the nearest number of integral waves between the transducers,

precisely measuring the fractional wavelength by which the acoustic path length exceeds an integral number of waves for upstream propagation,

combining the measured values to obtain a first precise value for the number of waves between the transducers for upstream propagation,

performing the measuring and combining steps for downstream propagation to obtain a second precise value for the number of waves between the transducers for downstream propagation, and

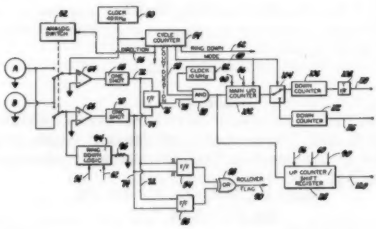
subtracting the second precise value from the first precise value wherein the resulting wave number difference is representative of fluid flow.

4,527,433

METHOD AND APPARATUS FOR MEASURING FLUID FLOW

Jeffrey S. Gutterman, Hilton, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 25, 1983, Ser. No. 545,258
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.28 **11 Claims**



1. In an acoustic fluid flow meter having a flow passage and

acoustic transducers mounted upstream and downstream respectively adjacent the passage and separated by an acoustic path length at least several times greater than the acoustic wavelength, the method of measuring fluid flow including the steps of:

energizing one of the transducers by a transmission signal to produce an acoustic pulse train continuing longer than the propagation time between the transducers to produce a received signal at the other transducer,

measuring the cumulative phase differences between the transmission signal pulses and received signal pulses during a measurement period including many pulses beginning after the received signal has stabilized and continuing while the transmission signal is present, and

alternating the roles of the transducers as sending and receiving transducers and repeating the phase difference measurements for both upstream and downstream acoustic signal propagation,

whereby the difference between upstream and downstream phase differences is a function of fluid flow through the passage.

4,527,434

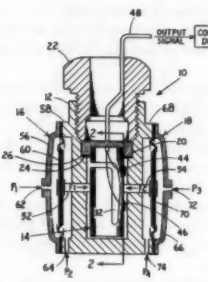
CYLINDRICAL FORCE TRANSDUCER BEAM

Jack M. White, Novelty, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 10, 1984, Ser. No. 608,689

Int. Cl.[3] G01L *1/22*

U.S. Cl. 73—867.65 **6 Claims**



1. In a transducer generating an output signal varying in proportion to changes in the magnitude of a force applied thereto, comprising a housing; a beam assembly cantilever mounted within said housing, said beam assembly including a tapered beam portion; and at least one strain gauge attached to said beam portion and operable to generate an output signal proportional to the strain in the beam produced by a force applied to said beam assembly; the improvement wherein said beam assembly comprises a single substantially cylindrical member having one end anchored to said housing and the other end free, a substantially L-shaped slot formed in said cylindrical member to define a lever portion and said beam portion, a first force transmitting member attached to said lever portion and a second force transmitting member attached to said beam portion.

4,527,435

CHANNELED PLUG PROPORTIONAL FLOW SAMPLER

Kenneth R. Hall, College Station, and James C. Holste, Bryan, both of Tex., assignors to Precision Machine Products, Inc., Dallas, Tex.

Filed Nov., 1983, Ser. No. 553,370

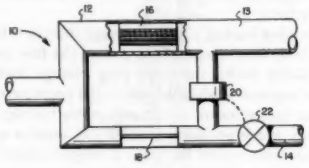
Int. Cl.[3] G01N *1/22*

U.S. Cl. 73—863.03 **17 Claims**

1. Apparatus for taking a proportionally constant flowing sample from a gas stream flowing through a main gas flow line comprising:

a first channeled plug flow splitter mounted within said main gas line and being formed with a plurality of channels extending therethrough having relatively equivalent hydraulic diameters;

a sample line extending out of said main gas line upstream of said first plug for receiving a select flow of gas therefrom;



a second channeled plug mounted within said sample line and having at least one channel formed therein for the passage of gas therethrough having an hydraulic diameter within the same order of magnitude as the hydraulic diameter of said channels of said first channeled plug; and

said channels of said first plug being formed with an average cross-sectional area substantially greater than the cross-sectional area of said channel of said second plug.

4,527,436

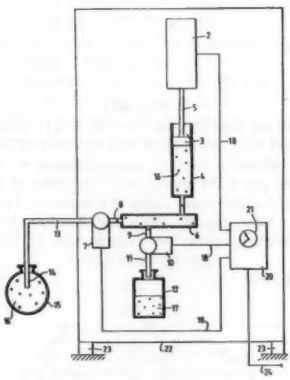
APPARATUS AND METHOD FOR SAMPLING A LIQUID

Richard W. Jones, 4 Upland Park Rd., Oxford OX2 7R4, England

Filed Dec. 6, 1983, Ser. No. 558,437

Int. Cl.[3] G01N *1/14*

U.S. Cl. 73—863.84 **10 Claims**



1. Apparatus for sampling a liquid comprising:

(a) a pump comprising a working piston and a cylinder;

(b) a drive means for reciprocating the working piston incorporating a means of signalling the two end of stroke positions of the working piston;

(c) a manifold communicating with an outlet of the cylinder;

(d) a feed valve communicating on one side with the manifold and on the other side with an inlet;

(e) a delivery valve communicating on one side with the manifold and on the other side with a delivery tube;

(f) a container for receiving a sample from the delivery tube; and

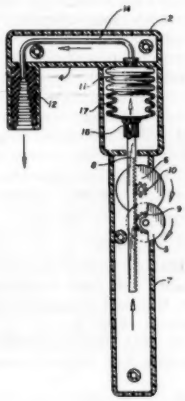
(g) a controller for regulating the operation of the working piston, the feed valve, and the sample valve.

10. A method of operating a sampler comprising the steps of:
(i) opening a feed valve to allow liquid in a pipeline to pressurize liquid within a manifold;
(ii) causing a drive means to operate a working piston so that material within a cylinder is forced through the manifold and into a sampling tube;
(iii) causing the drive means to operate the working piston so that material from the pipeline flows under pressure through the manifold to the cylinder;
(iv) repeating the steps (i) to (iii) to purge liquid originally in the cylinder from the cylinder and manifold and sampling tube;
(v) closing the feed valve;
(vi) opening the delivery valve;
(vii) causing the drive means to operate the working piston so that material from the cylinder is forced through the manifold and through the delivery tube into a collecting vessel;
(viii) closing the delivery valve;
(ix) opening the feed valve;
(x) causing the drive means to operate the working piston so that material from the pipeline flows through the manifold and into the cylinder; and
(xi) closing the feed valve.

4,527,437
PIPETTE CONTROLLER

John R. Wells, Culver City, Calif., assignor to Wescor, Inc., Logan, Utah

Continuation-in-part of Ser. No. 511,212, Jul. 6, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 672,159
Int. Cl.³ B01L *3/02*
U.S. Cl. 73—864.11 **17 Claims**

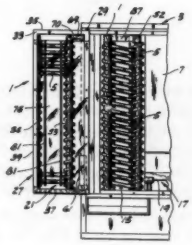


1. A pipette controller for facilitating a user's control of a pipette while pipetting liquids comprising:
a casing having an inverted "L" shape forming a handle and a neck,
at least one thumb wheel attached to the handle and adapted for rotational action,
a mechanical train engaged to the thumb wheel for converting the rotational action of the thumb wheel to translational action,
a bellows attached to the casing and engaged to the mechanical train, expandable and collapsible by the translational action of the mechanical train,
an air tube attached to the bellows for guiding air to and from the bellows,
a pipette connector attached both to the neck and to the the air tube, for connecting the pipette to the pipette controller, for positioning the pipette proximate to and substantially parallel to the handle, and for communicating air between the air tube and the pipette,
whereby the user operates the thumb wheel of the pipette controller to control liquids within the pipette connected to the pipette controller while the pipette is held proximate to and substantially parallel to the handle of the pipette controller in easy view of the user.

4,527,438
AUTOMATIC FEED SYSTEM FOR SAMPLING APPARATUS

Egil Fosslien, Glenview, Ill., assignor to Cortex Research Corporation, Northbrook, Ill.

Filed Sep. 28, 1983, Ser. No. 536,715
Int. Cl.³ G01N *35/04*
U.S. Cl. 73—864.81 **18 Claims**



1. Apparatus for obtaining samples from specimens of blood or the like contained in closed containers, such as stoppered tubes, said apparatus comprising first conveyor means for conveying a series of said tubes to a sampling station and for imparting a motion to the tubes to mix the contents of the tubes as they are conveyed to said sampling station, and means for penetrating each tube when it arrives at the sampling station to withdraw a specimen sample therefrom, the improvement comprising a feed system for automatically feeding tubes to said first conveyor means, said feed system comprising second conveyor means for conveying a series of said tubes one after another to a pick-up station, and tube transfer means for transferring a tube at said pick-up station from said second conveyor means to said first conveyor means for conveyance to said sampling station, said tube transfer means comprises a shuttle member movable from a first position for receiving a tube conveyed to the pick-up station by said second conveyor means to a second position for loading by tube onto said first conveyor means.

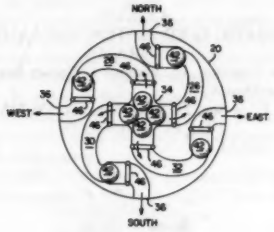
4,527,439
GYROSCOPE ERECTION SYSTEM

Maurice M. Orlarey, Charlevoix, Mich., assignor to Allied Corporation, Morris Township, N.J.

Filed Sep. 27, 1982, Ser. No. 423,989
Int. Cl.³ G01C *19/30*
U.S. Cl. 74—5.43 **5 Claims**

1. For a gyro of the type having a spinning rotor and means spinning therewith for providing a flow of air, and erection system characterized by:
a plurality of channels, each of which extends in a different direction;
means associated with the gyro and the erection system for directing the flow of air through the channels;
air flow control means arranged with the channels and including
a pair of balls disposed within each of the channels so as to roll therealong, each of the channels having a gate near an air inlet end and a gate near an air outlet end, the balls remaining stationary in the channels and away from the

gates for permitting air to flow through the gates when the gyro is erect, whereby the flow of air through the erection system is balanced, one of the balls in a first of the channels rolling in said channel to the gate near the inlet end thereof and cooperating with said gate to prevent air from entering the channels and thereby blocking the flow of air through the first channel when the gyro is tilted



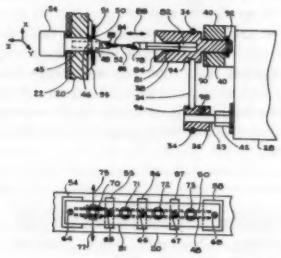
from the erect by more than a first relatively small predetermined angle and less than a second relatively large predetermined angle, and one of the balls in a second of the channels rolling in said channel to the gate near the outlet end thereof and cooperating with said gate to prevent air from exiting the channel and thereby blocking the flow of air through the second channel when the gyro is tilted from the erect by more than the second angle.

4,527,440

SELF-ALIGNING CONTROL MECHANISM

Christopher J. Heitman, and Gregory D. Schwehr, both of Milwaukee, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 12, 1983, Ser. No. 560,310
Int. Cl.³ E16H *35/18;* **G05G** *1/10*
U.S. Cl. 74—10 R **11 Claims**



1. A self-aligning control mechanism for adjusting a control device by means of rotational motion, said mechanism comprising:

a flexible shaft secured at one of its ends to a means for imparting rotational motion to the shaft; and

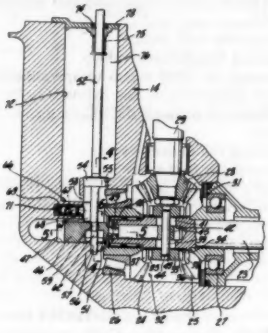
coupler means having an opening formed therein for releasably engaging the other end of said flexible shaft for rotational motion even when the opening and shaft are longitudinally misaligned, said coupler means being coupled to said control device for transmitting thereto the rotational motion of said flexible shaft, said coupler means having a funnel-shaped surface for receiving and guiding into the opening the other end of said shaft, even when said shaft and opening are laterally misaligned.

4,527,441

SHIFTING APPARATUS FOR A PROPELLING UNIT FOR A VESSEL

Ryoji Nakahama, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Feb. 23, 1983, Ser. No. 469,044
Claims priority, application Japan, Mar. 11, 1982, 57-37292
Int. Cl.³ F16H *3/14*
U.S. Cl. 74—378 **10 Claims**



1. In a shifting arrangement for a marine propelling unit or the like comprising an outer housing journalling an output shaft, a pair of oppositely rotating gears journalled on said output shaft, a clutch element rotatably coupled to said output shaft and axially movable relative thereto for selective driving engagement with said gears for driving said output shaft in a selected direction of rotation, a plunger for axially moving said clutch element, an operating element supported for reciprocation and operatively connected to said plunger for operating said plunger to shift said clutch element, and an elongated control rod, the improvement comprising said outer housing having an opening through which said control rod is inserted in an axial direction, said control rod having integral actuating means for reciprocating said operating element upon rotation of said control element, said integral actuating means being sized to pass through said outer housing opening.

4,527,442

MANUAL TRANSMISSION SHIFTING MECHANISM

Erwin Hoffmann, Bergheim, and Josef Schneider, Wesseling Berzdorf, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 22, 1982, Ser. No. 443,841
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147782
Int. Cl.³ B60K *41/26;* **G05G** *5/10, 9/12*
U.S. Cl. 74—411.5 **5 Claims**

1. A gear shift mechanism for a manual transmission comprising:

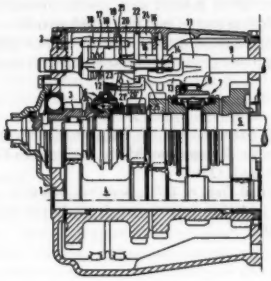
an input shaft carrying a synchronizing ring of a synchronizer unit adapted to apply a braking force to the input shaft as the synchronizing ring is moved against the input shaft;

a locking wheel fixed against axial displacement;

a gear selector shaft mounted for rotation and axial displacement having at least one selector finger, a first cam and radial arms extending outwardly therefrom;

a shift fork for moving the synchronizing ring, mounted on the gear selector shaft for axial displacement, having a surface engageable by the first cam whereby the shift fork is moved axially and the synchronizing ring is moved against the input shaft as the gear selector shaft is rotated to the reverse drive position;

a bracket arm mounted on the gear selector shaft, resiliently forced axially away from the shift fork, having a groove located for selective engagement by the selector finger and the locking wheel, thereby permitting axial displacement of the bracket arm if the selector finger engages the



groove and prohibiting axial displacement of the bracket arm if the locking wheel engages the groove; and

stop means with which the radial arms of the gear selector shaft make contact for limiting the extent of axial displacement of the gear selector shaft.

4,527,443

DEVICE FOR SUPPORTING AND SEALING A FINAL DRIVE SHAFT BEARING IN A SPEED CHANGE GEAR

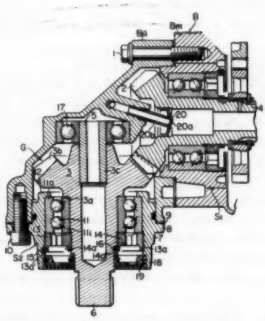
Yuzo Ohoka, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,555

Claims priority, application Japan, Oct. 29, 1981, 56-173198

Int. Cl.³ F16H *1/14, 1/20*

U.S. Cl. 74—417 **3 Claims**



1. A device for supporting and sealing a final drive shaft bearing in a speed change gear, comprising:

a gear box;

a bearing holder having an axis and fitted and fixed to said gear box and having a stopper flange at an axially inner end thereof;

a final drive shaft turnably supported by said bearing holder via a rolling element bearing and equipped with a helical bevel gear;

said rolling element bearing having an outer race and an inner race;

a first nut screwed to a cylindrical inner surface of said bearing holder and clamping said outer race of said rolling element bearing in cooperation with said stopper flange at the axially inner end of said bearing holder;

a second nut screwed to an outer circumferential surface of said final drive shaft and abutting and clamping said inner race of said rolling element bearing in cooperation with said bevel gear;

a seal housing integrally formed with said bearing holder and extending axially outside said first nut screwed to said bearing holder; and

an oil seal disposed inside said seal housing and having a seal lip coming into direct contact with the outer circumferential surface of said final drive shaft, wherein said first and second nuts having axially outside ends, respectively, those outside ends being disposed substantially on a common plane extending perpendicular to the axis of the bearing holder.

4,527,444

TILT-TELESCOPE STEERING WHEEL ARRANGEMENT

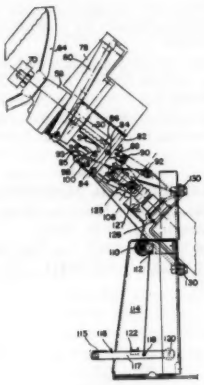
Kenneth E. McKee, Chicago; Harold G. Meitl, Darien; Vo V. Thanh, Willowbrook, and Craig A. Bixler, Woodridge, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Sep. 27, 1982, Ser. No. 423,507

Claims priority, application PCT Int'l Appl., Jul. 21, 1982, U.S. 82/00984

Int. Cl.³ B62D *1/18, 1/20;* **G05G** *5/24*

U.S. Cl. 74—493 **15 Claims**



1. A motor vehicle tilt and telescope steering wheel arrangement comprising:

a steering wheel rotatably mounted on a slanted steering column;

said steering column comprising tilt means and a tilt lock mechanism therefor;

said steering column comprising a steering wheel telescope means and a telescope lock mechanism therefor being independent of said tilt lock mechanism;

a lock release mechanism interconnected with said tilt lock and telescope lock mechanisms for simultaneous disengagement thereof in response to an operator's one-step actuation;

said telescope means comprising a non-rotatable shaft supporting said wheel being rotatable thereon for turning a steering shaft means via a gear set;

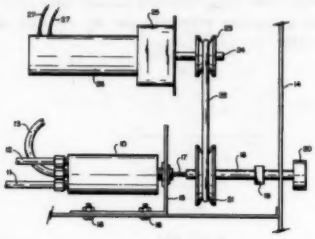
said steering shaft means connected and operatively engageable with said tilt lock mechanism.

4,527,445

AUTOMATIC CONTROL SYSTEM HAVING MANUAL CONTROL ENGAGABLE AT WILL

Eric K. Walton, Columbus, Ohio, assignor to ACR Process Corp., Champaign, Ill.

Filed Apr. 23, 1984, Ser. No. 604,194
Int. Cl.[3] F16H 27/02, 29/02
U.S. Cl. 74—625 6 Claims



1. A device for varying fluid pressure in increments to remotely position a mechanism, comprising

a source of fluid under pressure,

said fluid under pressure connected to the input of said device,

means for controlling the output pressure of fluid from said device to said remotely located mechanism in increments,

means for automatically directing the exercise of said control,

a coupling means which is frictionally operated positioned between said means for automatically directing the exercise of control and means for controlling the output pressure of said fluid,

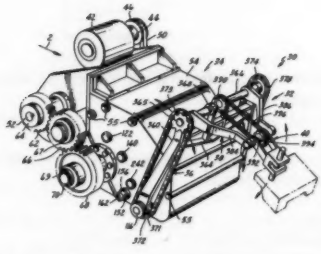
and a manually operated means which is capable of overcoming the friction forces of said frictionally operated coupling means and capable of directing the exercise of said control without disengaging said automatic means.

4,527,446

CAM-ACTUATED ROBOTIC MANIPULATOR SYSTEM

Daniel J. Borodin, Sterling Heights, Mich., assignor to U.S. Automation Company, Detroit, Mich.

Filed Mar. 26, 1982, Ser. No. 362,539
Int. Cl.[3] B25J 11/00; F16H 25/16, 35/08
U.S. Cl. 74—828 20 Claims



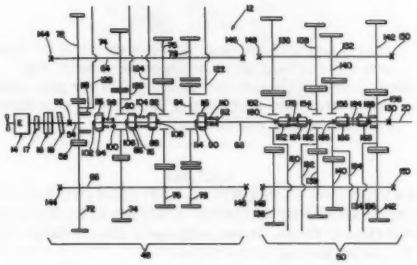
1. A manipulator system comprising support means; a manipulator arm carried by said support means for pivotal movement about at least one axis; four-bar linkage means including a first bar defined between first and second pivot axes disposed at predetermined positions with respect to said support means, second and third bars respectively pivotally mounted at said first and second pivot axes, and a fourth bar pivotally connected to said second and third bars at positions spaced from said first and second axes; drive means coupled to said second bar; means coupling said third bar to said manipulator arm; and means for variably positioning said second axis with respect to said support means for varying amplification between said drive means and said manipulator arm, said variable positioning means comprising a bell crank carried by said support means to pivot about a fixed axis, means pivotally mounting said third bar to one end of said bell crank to define said second axis, and means coupled to the opposite end of said bell crank for pivoting said bell crank with respect to said support means.

4,527,447

AUTOMATIC MECHANICAL TRANSMISSION SYSTEM

Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 6, 1982, Ser. No. 446,918
Int. Cl.[3] F16H 3/08, 3/38, 5/50; B16K 41/04
U.S. Cl. 74—866 15 Claims



1. An automatic mechanical transmission system comprising:

a compound splitter type change gear transmission comprising a multi-speed main transmission section connected in series with a multi-speed auxiliary transmission section, said transmission comprising a housing defining a main and an auxiliary section;

said main transmission section comprising;

an input shaft rotationally supported in said housing and carrying an input gear rotationally fixed thereto, a plurality of spaced and substantially parallel main section countershafts mounted for rotation within said housing, a plurality of main section countershaft ratio gears mounted on each of said main section countershafts, the main section countershaft ratio gears on one main section countershaft being grouped with and radially spaced from identical main section ratio gears on the other main section countershafts for defining main section countershaft gear groups;

means for supply input power to each of said main section countershafts;

a mainshaft disposed between and substantially parallel with said plurality of main section countershafts, said mainshaft extending into said auxiliary section;

a plurality of main section mainshaft ratio gears disposed substantially concentrically of said mainshaft and substantially axially fixed relative thereto, each of said main section mainshaft ratio gears being disposed in continuous driving engagement with a respective one of said main section countershaft gear groups;

releasable nonblocked, nonsynchronized clutch means associated with said main section mainshaft ratio gears for selectively nonrotatably interconnecting same to said mainshaft, said nonblocked, nonsynchronized clutch means including first and second jaw clutch members nonrotatably associated with said main section mainshaft gears and said mainshaft, respectively, said second jaw clutch member being axially slidably mounted on said mainshaft, and

main section shift means for selectively axially moving selected ones of said first and second jaw clutch members;

said auxiliary transmission section comprising:

an output shaft rotationally supported in said housing and carrying an output gear splined thereto for rotational movement therewith and axial movement relative thereto,

a plurality of spaced and substantially parallel auxiliary section countershafts mounted for rotation within said housing, a plurality of auxiliary section countershafts ratio gears mounted on each of said auxiliary section countershafts, the auxiliary section countershaft ratio gears on one auxiliary section countershaft being grouped with and radially spaced from identical auxiliary section countershaft ratio gears on the other auxiliary section countershafts for defining auxiliary section counterhsaft gear groups, one of said auxiliary section countershaft groups constantly meshed with said output gear,

at least one auxiliary section mainshaft ratio gear disposed substantially concentrially of said mainshaft, each of said auxiliary section mainshaft ratio gears being disposed in continuous meshing engagement with a respective one of said auxiliary section countershaft gear groups;

blocked auxiliary section clutch means associated with said auxiliary section mainshaft ratio gears and said output gear for selectively nonrotatably interconnecting same to said mainshaft, said auxiliary section clutch means each including first and second auxiliary section jaw clutch members nonrotatably associated with said auxiliary section mainshaft ratio gear and output gear, and said mainshaft, respectively, said second auxiliary section jaw clutch member being axially slidably mounted on said mainshaft, and resilient means urging said auxiliary section second jaw clutch member in a direction toward said auxiliary section first jaw clutch member, a nondeformable blocker ring carried by said auxiliary section second auxiliary jaw clutch member for rotation therewith with a predetermined relative rotation therebetween, said blocker ring axially movable relative to said auxiliary section second clutch member in at least one axial direction, said blocker ring operable to tend to rotate with said auxiliary section first clutch member at initiation of an auxiliary section clutch engaging operation, said blocker ring and auxiliary section second clutch member each having projections extending therefrom defining an array of interacting projections, said array of interacting projection effective to block relative axial movement of said auxiliary section second clutch member if not aligned, said blocker ring having at least one rotational position relative to said auxiliary section second clutch member wherein said array of projections are aligned and at least one rotational position relative to said auxiliary section second clutch member wherein said array of projections are not aligned, said blocker ring effective to sense nonsynchronous rotation of said auxiliary section clutch members corresponding to blocker ring rotation relative to said auxiliary section second clutch member sufficient to cause a nonalignment of said array of projections to block axial engagement of said auxiliary section clutch members, and stop means coacting between said auxiliary section second jaw clutch member and said mainshaft for limiting the axial movement of auxiliary section second jaw clutch member, said resilient means including spring means resiliently urging said auxiliary section second jaw clutch member against said stop means, said arrays having complementary ramps thereon which, under the bias of said spring when said main transmission section is not engaged, will tend to cause said arrays to align;

auxiliary section shift means for axially shifting said auxiliary section mainshaft ratio gear and said output gear one at a time relative to said mainshaft from first positions wherein one of said auxiliary section mainshaft ratio gear and output gear are spaced from and out of engagement with said auxiliary section second jaw clutch member to a second position wherein one of said auxiliary section mainshaft ratio and output gear contacts said auxiliary section second jaw clutch member and axially displaces same in opposition to the urging of said spring means for creating a resilient clutch engaging force to cause the auxiliary section jaw clutch members to meshingly engage when the speeds thereof are substantially synchronized; and

a control assembly for automatically operating said main section and auxiliary section shifting means, said control unit having means to receive input signals, a central processing unit for determining a desired transmission ratio by processing said input signals in accordance with a program and means to generate command output signals to said shifting means, said processing unit commanding changes in transmission ratio in a sequence comprising shifting the main transmission section to neutral during each ratio change, said processing unit commanding shifts of the transmission involving a change in auxiliary section engaged ratio but not a change in main section engaged ratio by a sequence comprising shifting the main transmission section to neutral, completing a shift in the auxiliary section while the main section remains in neutral and thereafter reengaging the main transmission section.

4,527,448

HYDRAULIC CONTROL SYSTEM FOR ELECTRONIC TRANSMISSION CONTROL

Dennis W. Person, Rockwood; Stanley L. Pierce, Northville, and Po-lung Liang, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1982, Ser. No. 453,270
Int. Cl.³ B60K *41/04*
U.S. Cl. 74—869 **8 Claims**

1. A system for controlling operation of an automatic transmission comprising:

multiple clutches and a brake servo which upon being pressurized connect or hold elements of the transmission gearing and upon being vented disconnect or release elements of the transmission gearing, whereby the various drive ratios are produced;

a source of pressurized hydraulic fluid;

a manual valve having multiple settings corresponding to selected drive range of the transmission adapted to connect the pressure source to a first outlet when the manual valve is set for operation in a first or a second drive ratio, to a second outlet when the manual valve is set for operation in the second drive ratio and to a third outlet when the manual valve is set for operation in a forward drive range;

feedline valve means having a spool movable between first and second states on which are formed muliple differential pressure areas of substantially equal net size for hydraulically connecting the third outlet of the manual valve to a first outlet feedline when the spool is in the first state and to a second outlet feedline when the spool is in the second state;

means communicating each clutch with a respective differential pressure area of the feedline valve spool on which are developed pressure forces that bias the spool to its second state;

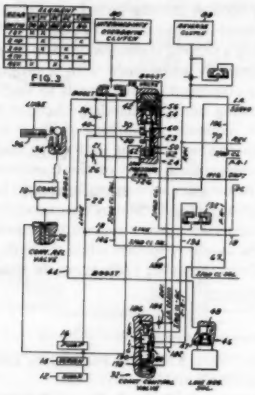
feedback valve means communicating with the first feedline having a pressure area whose size is at least one net differential pressure area less than the total net differential pressure areas of the valve spool, on which area is developed a pressure force that biases the feedline valve spool to its first state and a spring for biasing the feedline valve spool to the first state;

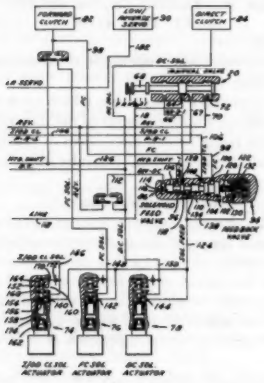
actuating means for pressurizing the clutches from the first feedline and for venting the clutches;

means for selectively communicating the second feedline to those clutches that are pressurized when a predetermined speed ratio is produced; and

coast control valve means connected to the first and second outlets of the manual valve for connecting the brake servo to the first outlet of the manual valve, for regulating the hydraulic pressure of the brake servo when the manual

valve is set for operation in the first drive ratio, and for connecting the brake servo to the first outlet of the manual





valve means when the manual valve means is set for operation in the second drive ratio.

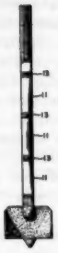
4,527,449

BORING BIT AND METHOD FOR MANUFACTURE THEREOF

William E. Sydlowski, Wakefield, Mass., and Harold A. Trent, San Leandro, Calif., assignors to Rule Industries, Inc., Gloucester, Mass.

Filed Sep. 13, 1982, Ser. No. 416,850
Int. Cl.³ B21K *5/02;* **B23B** *51/00*
U.S. Cl. 76—108 R **12 Claims**

8. A method for providing the shank of a boring bit for power drills with bore depth indicator markings which comprises colorably and thinly oxiding substantially the entire shank of the bit and selectively abrading spaced apart bands of substantially only said thin colored oxide therefrom, thereby to expose corresponding bands of bright shank metal thereunder



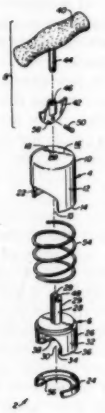
in alternate array with spaced apart bands of said thin colored oxide.

4,527,450

STOPPER EXTRACTOR

Billy J. Drosky, 719 Circle Ct., San Francisco, Calif. 94080

Filed Nov. 7, 1983, Ser. No. 549,108
Int. Cl.³ B67B *7/00*
U.S. Cl. 81—3.29 **2 Claims**



1. An extractor for removing a stopper from a container, the stopper of the type having an enlarged head which remains outside of the container, the extractor comprising:

a housing, having a side wall terminating in a lower edge, a lower end and an upper end, the upper end having a portion defining an outer housing face;

a grip, disposed for axial movement along a longitudinal axis of the housing, the grip having an inwardly extending lip to at least partially underly the head of the stopper;

a cam, pivotally mounted to the grip at a pivot point and positioned above the upper end of the housing, so that a surface of the cam bears against the outer housing face;

handle means, connected to the cam for pivoting the cam about the pivot point, the pivot point located relative to the cam surface;

the housing having an upper region sized to capture the stopper therein and including an edge guard mounted to the lower edge, the edge guard having an inwardly extending lip configured to mate with the neck of the container surface;

the housing being formed with a cutout sized to allow the

enlarged head of the stopper to be inserted laterally through the cutout;

the grip, being contained in the housing, the grip having an interior and a cutout, said interior and cutout shaped and sized to allow the enlarged head of the stopper to be inserted into and housed within the interior of the grip; and

biasing means, disposed between the grip and the housing, for biasing the grip to a position at the lower end of the housing wherein the lip on the grip is proximate the lip on the housing so that both the lips fit between the lower edge of the stopper head and a container surface thereby ensuring that the lip on the grip snugly engages the stopper head and the lip on the housing bears upon the container surface so that upon movement of said handle means, the pivot point moves axially upwardly away from the housing face to pull the grip axially within the housing and the stopper therewith axially away from the container and capture the stopper within the housing.

4,527,451

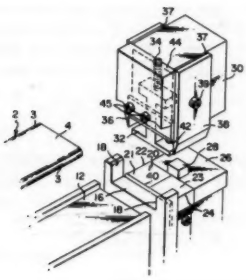
STRIPPING TOOL FOR SHIELDED RIBBON CABLE

Newton G. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 29, 1984, Ser. No. 614,356

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.51 **11 Claims**



1. An apparatus for stipping a length of insulation from the end of a shielded ribbon cable, said apparatus comprising:

positioning means for positively positioning the lateral edges of said cable proximate said end,

shearing means for simultaneously shearing insulation from opposed lateral edges of the cable along said length at the end of the cable, said shear means moving transversely of the plane of the cable, said shear means exposing said shield on at least one edge of the cable proximate said end,

first and second scoring blades for forming parallel cuts in the insulation on opposite planar sides of said cable, each cut being spaced said length from said end, said blades having parallel rectilinear edges which penetrate said insulation without cutting said shield.

4,527,452

CUTTING DEVICE FOR CUTTING ELONGATED PROFILES INTO SECTIONS

Karl-Rainer Lindner, Stockhausstr. 11, 4010 Hilden im Rheinland, Fed. Rep. of Germany

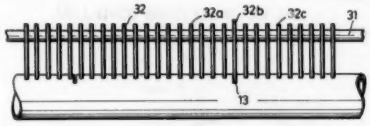
Filed Apr. 16, 1984, Ser. No. 601,140

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314114

Int. Cl.³ B21D *43/28*

U.S. Cl. 83—209 **16 Claims**

1. A device for aligning elongated profiles, particularly tubes having perforated portions, with a saw blade for cutting tubes into tube sections, wherein elongated tubes are provided with cutouts spaced from each other at equal intervals and defining raster marks at which tubes are to be cut into tube sections, the aligning device comprising scanning means including a plurality of scanning fingers mounted in contact with the elongated tube to be cut into tube sections and spaced from each other along the elongation of the tube a distance substantially smaller



than the interval between adjacent cutouts on the tube; and drive means for rotation and axial displacement of each tube, at least one of said scanning fingers being engageable in one of said cutouts upon the rotation and axial displacement of the tube.

4,527,453

MITER SAW EQUIPPED WITH MEANS FOR LOCKING THE SAW TABLE

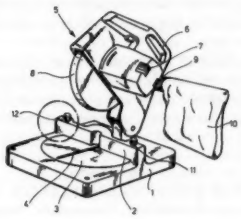
Hartmut van Hauten, Wiesbaden, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 18, 1984, Ser. No. 601,587

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 8311514

Int. Cl.³ B27B *9/00*

U.S. Cl. 83—467 R **20 Claims**



13. A miter saw, comprising:

a saw table rotatably mounted on a base plate;

a saw unit mounted on the saw table;

a fence extending over an upper surface of the saw table and having a lower face overlying said saw table;

at least one through bore located in the fence;

said through bore having an enlarged lower end communicating with said lower face of the fence;

an annular surface defined by an upper portion of said enlarged lower end, the distance between said lower face of the fence and said annular surface increasing over at least part of the circumference of said annular surface; and

a clamping member rotatably located in said through bore, said clamping member having a lower portion adapted to co-operate with said annular surface, whereby on rotation of said clamping member in said through bore, said clamping member is operable to clamp and to release the saw table relative to said base plate.

4,527,454

ROTARY SHEET-METAL TRIMMING SHEAR

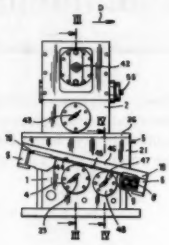
Horst Walter, Herdecke, Fed. Rep. of Germany, assignor to Hoesch Werke Ag, Dortmund, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,113

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231354

Int. Cl.³ B23D *19/06*; B26D *1/24*

U.S. Cl. 83—499 **19 Claims**



1. A rotary shear for trimming sheet metal, the shear comprising:

a main support beam extending perpendicular to a normal workpiece transport direction and symmetrical about a central upright plane extending in the transport direction, the beam having a generally planar upper surface formed by a family of parallel and horizontal lines and inclined downward against the transport direction;

a pair of symmetrically identical housings carried on the beam and each displaceable therealong transverse to the direction, the housings each being provided with a slide having a planar lower surface lying generally flatly on the beam surface, the housings and beam being provided with guides engageable parallel to the surfaces with each other, the surfaces being inclined so much to the horizontal that the guides are naturally urged together in the transport direction, the surfaces and materials of the slide and beam being such that the horizontal component of force effective by gravity between them is greater than the friction between them; and

respective pairs of upper and lower rotary trimming blades carried on the housings, the upper and lower blades being rotatable about respective common axes substantially perpendicular to the transport direction.

4,527,455

DEVICE FOR OPENING ENVELOPES OR THE LIKE

Francois Morax, Rüschlikon, Switzerland, assignor to DELTA-REAL Establishment, Fürstentum, Liechtenstein

PCT No. PCT/EP82/00086, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/03206, PCT Pub. Date Sep. 30, 1982

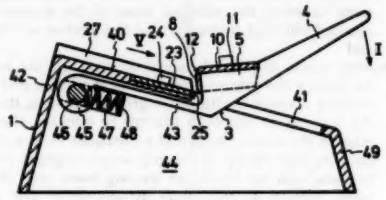
PCT Filed Mar. 12, 1982, Ser. No. 433,118

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109501

Int. Cl.³ B43M *7/00*

U.S. Cl. 83—588 **10 Claims**

1. An apparatus for opening envelopes, comprising: base means; an elongate arm supported at a first end thereof on said base means for pivotal movement about a pivot axis and having at a second end thereof remote from said first end means defining a stop surface which faces toward said pivot axis; means defining an upwardly facing support surface on said base means which is located between said pivot axis and said stop surface, which terminates in an elongate first cutting edge spaced a small distance from said stop surface, and which extends from said first cutting edge in a direction away from said stop surface; means defining a first knife blade which projects outwardly from said stop surface and has an elongate second cutting edge thereon which extends at a small angle to and slidably engages said first cutting edge; and a handle



fixedly supported on said arm at said second end thereof and projecting outwardly in a direction away from said pivot axis.

4,527,456

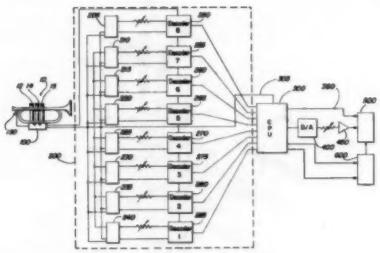
MUSICAL INSTRUMENT

William R. Perkins, 3872 Cody Rd., Sherman Oaks, Calif. 91403, and James L. Cooper, 3512 Rosewood Ave., Los Angeles, Calif. 90066

Filed Jul. 5, 1983, Ser. No. 510,726

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.04 **43 Claims**



1. A music instrument comprising:

wind music instrument means of the type wherein the emitted acoustic notes are dependent upon the placement of selection means determining the instrument air column length;

electronic synthesizer means, including means for generating tones in dependence upon control signals; and

interface means coupling said wind instrument means to said synthesizer means, comprising

(i) transducer means adapted to provide analog transducer signals corresponding to said emitted acoustic notes,

(ii) sensing means for sensing the position of said selection means and generating a sensing signal indicative of said position, and

(iii) control means responsive to said transducer signals and said sensing signals for generating a control signal representative of said emitted acoustic notes, said control signal being coupled to said synthesizer means to control sounds to be synthesized by said synthesizer.

4,527,457

RECOILLESS ELECTROMAGNETIC PROJECTILE LAUNCHER

Douglas A. Fikse, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1983, Ser. No. 483,800

Int. Cl.³ F41F *1/00*

U.S. Cl. 89—8 **9 Claims**

1. A recoilless electromagnetic projectile launcher comprising:

a first conductor;

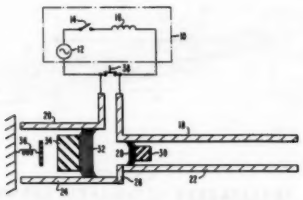
a second conductor disposed generally parallel to said first conductor;

means for propelling a projectile from a first end of said first and second conductors to a second end thereof and for conducting current therebetween;

a third conductor;

a fourth conductor disposed generally parallel to said third conductor;

means for propelling a recoil mass from a first end of said third and fourth conductors to a second end thereof and



for conducting current therebetween, wherein said recoil mass is propelled in a direction opposite to the direction in which said projectile is propelled;

means for connecting said second and third conductors;

a source of electric current electrically connected to said first and fourth conductors; and

means for switching current from said source to said first and fourth conductors, whereby the current required for launching said projectile at a predetermined velocity is transferred to said first, second, third and fourth conductors.

4,527,458

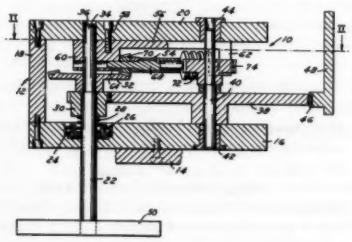
TURRET DRIVE SYSTEM FOR ARMORED VEHICLE

D. Dale Johnson, Mt. Clemens, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 12, 1983, Ser. No. 530,940

Int. Cl.[3] **F41F** *21/14*

U.S. Cl. 89—41.01 **3 Claims**



1. In an armored vehicle having a turret and a ring gear connected to the turret; a manually operated auxiliary drive having a first gear train having an input and an output for manually driving the ring gear, gear lock-up train means including synchronizing gear means synchronizing drive of the lock-up train with the first gear train for producing free transfer of torque from the input to the output of said first gear train, and means including a gear engage spring that is compressed to de-couple said synchronizing gear means from said first gear train when said manually operated drive is not in use, said gear lock-up train means having its synchronizing gear means back driven in responsive to externally applied forces on the turret to lock the output of said first train when said synchronizing gear means are decoupled to prevent the turret from rotating when externally applied forces are imposed thereon.

4,527,459

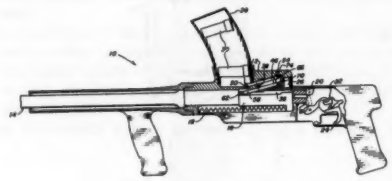
SMALL ARMS AMMUNITION LOADING SYSTEM

Carroll D. Childers, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1983, Ser. No. 524,186

Int. Cl.[3] **F41D** *10/02*

U.S. Cl. 89—161 **3 Claims**



1. An ammunition transfer device for use in an automatic gun of the type having a magazine holding individual rounds and a reciprocating barrel comprising:

a chamber block having a firing chamber therein and a cam path on at least one external surface, said chamber block reciprocates with the barrel between a battery position and a forward position;

a round carrier pivotally attached to the gun and operatively connected to the cam path on the chamber block, said round carrier moves in timed relation with said chamber block reciprocation as defined by the cam path between a stagging position for receiving the round from the magazine and a chambering position for positioning the round received therein co-axial with the firing chamber for insertion therein, said round carrier adapted to maintain control over the position of the round in its receipt providing for repetitive co-axial positioning of all individual rounds;

said round carrier including a support member pivotally attached to bar linkage which linkage includes at least one cam follower traveling in the cam path;

a pair of accurately shaped fingers pivotally attached to the support member and spring biased together for encircling and engaging the rounds for securely holding them for transfer to the chambering position;

said fingers including a ramp on inner surfaces thereof providing surfaces for receiving a force for spreading the fingers apart for receiving the round therebetween; and

means mounted on said chamber block adapted to move in timed relation with said chamber block reciprocation and round carrier movement for stripping the rounds from the magazine and moving the round stripped therefrom into engagement with said round carrier to be received therein.

4,527,460

RADIAL PISTON MACHINE

Egon Eisenbacher, Karlstadt, Fed. Rep. of Germany; Sinclair Cunningham, Kinghorn, Scotland; Peter Wüsthof, Lohr-/Main, Fed. Rep. of Germany, and Sinclair Cunningham, Kinghorn, Scotland, assignors to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,034

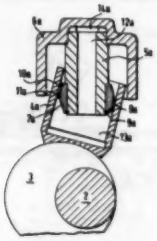
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147240

Int. Cl.[3] **F01B** *15/04, 1/06;* **F04B** *29/00*

U.S. Cl. 91—491 **4 Claims**

1. A radial piston machine comprising a housing formed with control channels and enclosing a rotary shaft formed with an eccentric; a plurality of radial pistons each having a cylindrical outer wall and a spherical socket; a corresponding plurality of radially directed connecting rods each having a central throughgoing passage, each fixidly secured at one end

thereof to the housing so that the central passage communicate with the respective control channels, and each forming at its opposite end together with the spherical socket of the assigned piston a ball-and-socket joint with one pair of spherical sliding surfaces; a pair of spherical sliding surfaces being mounted on the periphery of said spherical socket; a corresponding plural-



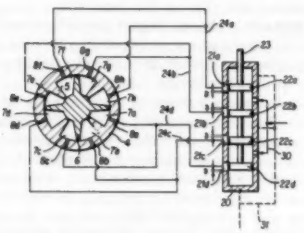
ity of cylinders each having a bottom portion which slidably engages said eccentric, an inner wall which slidably engages the cylindrical outer wall of the assigned radial piston and forms together therewith a pair of cylindrical sliding surfaces, so that two different pairs of sliding surfaces are formed thus providing essential high pressure sealing between each of said radial pistons and each of said cylinders.

4,527,461

ROTATING SERVOMOTOR APPARATUS

Kunio Ogura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 329,587, Dec. 10, 1981, abandoned. This application May 22, 1984, Ser. No. 611,927
Claims priority, application Japan, Dec. 18, 1980, 55-179200
Int. Cl.[3] **F15B** *13/04*; **F16K** *3/24*
U.S. Cl. 91—519 **6 Claims**



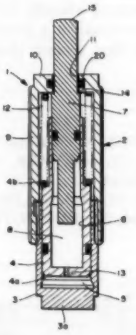
1. A rotating servomotor apparatus comprising:
a rotating servomotor including,
a rotatable spindle having a plurality of partition members, and
a cylinder having a plurality of stationary partition members disposed around said spindle,
said rotating servomotor having a plurality of compartments partitioned radially between said spindle partition members and said stationary partition members;
distributing valve means for supplying fluid to said compartments and for draining fluid from said compartments, including
a first distributing valve connected to one side of said plural compartments within said cylinder of said rotating servomotor, and
a second distributing valve connected to the other side of said plural compartments,
said first and second distributing valves including piston means for controlling the supplying and draining of fluid to and from said compartments, said piston means having a neutral position in which fluid is supplied only into selected of plural compartments and in which fluid is drained only from the non-selected of said compartments located radially opposite a respective of the selected compartments to exert continuously a balanced rotational pressure and an unbalanced translational pressure against said rotatable spindle.

4,527,462

SEALED-TYPE AUTOMATIC TENSIONER

Yoshio Okabe, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Apr. 6, 1984, Ser. No. 597,352
Claims priority, application Japan, Apr. 8, 1983, 58-51461[U]; Apr. 8, 1983, 58-51462[U]; **Apr. 8, 1983, 58-51463**[U]
Int. Cl.[3] **F01B** *7/20*
U.S. Cl. 92—51 **7 Claims**

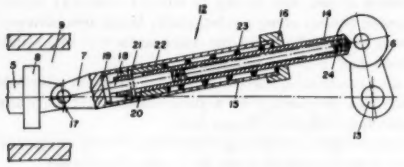


1. A sealed-type automatic tensioner comprising:
(a) a body assembly composed of a pair of first and second interengaging tubular bodies having top and bottom walls, respectively, said top wall having a hole defined therethrough;
(b) a tubular plunger slidably disposed in said body assembly and having a bottom wall, said second tubular body defining a larger-diameter chamber therein axially between said bottom wall of said second tubular body and said bottom wall of said tubular plunger;
(c) a piston slidably disposed in said tubular plunger and having a portion extending slidably through said hole in said top wall of the first tubular body, said tubular plunger having a central bore defining a smaller-diameter chamber axially between said piston and said bottom wall of said tubular plunger, said bottom wall of said tubular plunger having an aperture through which said larger- and smaller-diameter chambers communicate with each other, said larger- and smaller-diameter chambers being filled with a hydraulic medium; and
(d) a spring disposed in said first tubular body and acting between said top wall of the upper tubular body and said tubular plunger for normally urging said tubular plunger to move in a direction into said larger-diameter chamber.

4,527,463
DOSING PUMP FOR LIQUIDS

Scato Albarda, Gross Schenkenberg, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,608
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331558
Int. Cl.[3] F16J 1/10; F04B 49/00
U.S. Cl. 92—84 1 Claim



1. A dosing pump comprising a housing having a pump chamber, inlet and pressure outlet means connected to said chamber, a pump piston movable in said chamber to draw fluid in said inlet means and pump it out said outlet means, piston stroke limiting means carried by said housing limiting the length of the stroke of said piston, drive means connected to said piston including a crank and a piston connecting rod connected between said crank and said piston, said piston connecting rod having elastically extendable and retractable parts which permit extension and retraction of said piston rod in accordance with the limitation of the length of the stroke of said piston, said piston connecting rod including a first part connected to said crank and a second part connected to said piston, one of said parts being hollow and the other of said parts being telescopic within said one of said parts, spring means within said hollow part biasing said parts to an outwardly extendible position, each of said first and second parts being hollow and wherein the hollow part which is connected to said crank has an opened end, a bolt positioned in the open end, a spring within said part connected to said crank biasing said bolt in a direction to engage said part connected to said piston, an axially extending slot defined in said part connected to said crank, a guide pin extending through said part and guided in said slot for axial movement and a second spring arranged around said part connected to said crank and biasing against said pin, said part connected to said piston having an end piece closing the end of said part around said part connected to said crank.

4,527,464
CYLINDER-PISTON COMBINATION, PARTICULARLY FOR HIGH-PRESSURE APPLICATION

Bernhard Frey, Schaffhausen, Switzerland, assignor to Hydrowatt Systems Limited, London, England

Division of Ser. No. 127,590, Mar. 6, 1980, Pat. No. 4,329,914, which is a continuation of Ser. No. 860,183, Dec. 13, 1977, abandoned, which is a continuation of Ser. No. 639,700, Dec. 11, 1975, abandoned. This application Mar. 19, 1982, Ser. No. 359,830
Claims priority, application Switzerland, Dec. 17, 1974, 16800/74; Nov. 27, 1975, 15354/75
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.[3] F01B 19/04
U.S. Cl. 92—86.5 5 Claims

1. A piston and cylinder combination for high-pressure fluid applications, comprising:

two working members movable relatively to each other, one of said working members defining a piston and the other thereof defining a cylinder;

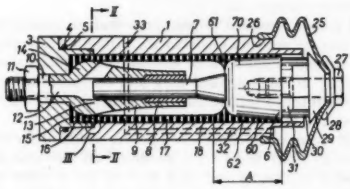
said working members defining therebetween a working chamber with strokes of increasing and decreasing working chamber volume, said working chamber under operating conditions being filled with a working fluid under high pressure in at least a part of one of said strokes;

an at least partially cylindrical sealing member connected with each of said working members so as to seal the working chamber, said sealing member being elastically deformable at least in its axial direction;

a support surface provided at one surface of said sealing member for supporting such sealing member against the high pressure of the working fluid in said working chamber;

at the surface of said sealing member facing said support surface there being provided a layer of a lubricant fluid streaming axially along said at least partially cylindrical sealing member and along said support surface from a lubricant inlet to a lubricant outlet;

said deformable sealing member having a transition zone



defining a connection interface with one of said working members which is arranged movable in relation to said support surface, said connection interface of the transition zone of said sealing member being chemically or physically bonded to said movable working member;

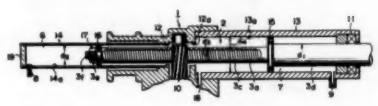
said transition zone being arranged so as to form said lubricant fluid outlet and to allow the lubricant fluid to escape to a low-pressure region; and

said transition zone further being arranged so as to transmit a portion of said working fluid pressure to the lubricant fluid and thereby to said support surface, said transmitted portion of the working fluid pressure decreasing downstream with the flow of lubricant fluid along the transition zone towards said lubricant fluid outlet, the non-transmitted portion of the working fluid pressure being at least partially transferred via said connection interface to said movable working member.

4,527,465
CYLINDER APPARATUS FOR RACK AND PINION TYPE POWER STEERING MECHANISM OF MOTOR VEHICLE

Kenji Yoshida, Zama, and Yuichi Sanada, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 20, 1982, Ser. No. 409,864
Claims priority, application Japan, Oct. 6, 1981, 56-159160
Int. Cl.[3] F01B 9/00
U.S. Cl. 92—136 2 Claims



1. A cylinder apparatus for a rack and pinion type power steering mechanism, comprising:

a gear housing including a power cylinder;

a pinion disposed in said gear housing and operatively connected to a steering wheel;

a rack shaft provided with a rack portion disposed in intermeshing relationship with said pinion, said rack shaft being

axially movably inserted in said power cylinder with one end thereof extended out of one end of said power cylinder and coupled to a steering linkage, said rack shaft comprising a large-diameter section, an intermediate-diameter section constituting said rack portion and a small-diameter section, there being a stepped junction between said large-diameter section and said intermediate-diameter section and a stepped junction between said intermediate-diameter section and said small-diameter section;

a first pressure chamber defined in said power cylinder in such a manner that pressure fluid can be introduced thereinto;

a second pressure chamber defined in said power cylinder in such a manner that pressure fluid can be introduced thereinto;

first means provided on said rack shaft in association with said first pressure chamber for providing a first effective pressure-applied area operative to urge said rack shaft in a first direction when said pressure fluid is introduced into said first pressure chamber; and

second means provided on said rack shaft in association with said second pressure chamber for providing a second effective pressure-applied area substantially equal to said first effective pressure-applied area and operative to urge said rack shaft into a second direction when said pressure fluid is introduced into said second pressure chamber;

said first means comprising a first power piston disposed in said power cylinder and fixedly mounted on said intermediate-diameter section of said rack shaft at the stepped junction between said large-diameter section and said intermediate-diameter section in such a manner that said first pressure chamber is defined between said first power piston and said one end of said power cylinder;

said second means comprising a second power piston disposed in said power cylinder and fixedly mounted on said small-diameter section of said rack shaft at the stepped junction between said intermediate-diameter section and said small-diameter section in such a manner that said second pressure chamber is defined between said second power piston and the other end of said power cylinder.

4,527,466

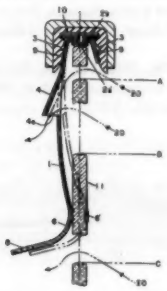
AUTOMOBILE VENTILATION EXHAUST AND RAIN SHIELD

Albert A. Kossor, 13 N. 12th St., Kenilworth, N.J. 07033, and Julius A. Kossor, 112 Chestnut St., West Orange, N.J. 07052

Continuation-in-part of Ser. No. 520,636, Aug. 8, 1983, abandoned. This application Jul. 23, 1984, Ser. No. 633,666

Int. Cl.³ B60J *1/20*

U.S. Cl. 98—2.13 **21 Claims**



1. A device for providing ventilation for the interior of a vehicle comprising at least one window having a frame with a peripheral trough around the top and sides, and a window pane constrained to be raised and lowered in said frame;

said device comprising a ventilating shield of semi-rigid resilient plastic material, having a length substantially corresponding to the width of the upper portion of said window frame, said shield having along its upper edge an inwardly-directed inverted substantially U-shaped flange constructed and arranged to fit into the top peripheral trough of said window frame;

means for securing said U-shaped flange in said top window trough;

said ventilating shield having a downwardly-extended skirt constructed to cover externally at least in part an upper portion of said window in open or closed position, the upper portion of said skirt having an internal concavity biased to provide contact along a substantially linear area between its lower inner surface and the outer surface of said window pane when in closed position;

said skirt terminating substantially along its lower edge below said area of contact in a downwardly and outwardly-projecting deflecting flange; and

ventilating means comprising a plurality of vents interposed in spaced-apart relation along the length of said skirt.

4,527,467

FILTER DEVICE FOR MAKING TEA

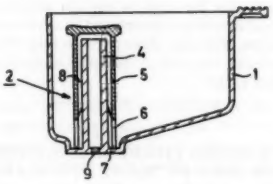
Sidonius V. Siemensma, Bedum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,140

Claims priority, application Netherlands, Feb. 7, 1983, 8300451

Int. Cl.³ A47J *31/02*

U.S. Cl. 99—279 **3 Claims**

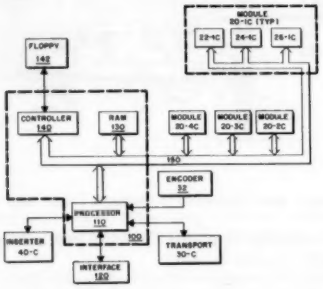


1. A device for use in brewing tea, which comprises a bowl having an outlet aperture formed in its bottom for discharge of brewed tea; an outlet tube communicating with said outlet aperture and extending upwardly from the bottom of the bowl; a sleeve surrounding and spaced from said outlet tube to provide an annular siphon passageway therebetween, the upper end of said sleeve being closed and the lower end of said sleeve resting on the bowl bottom; and capillary inlet apertures formed in the lower portion of said sleeve, the dimensional relationship of said capillary inlet apertures to said annular siphon passageway being such that, when the capillary inlet apertures are exposed by the fall of the liquid level in the bowl, the static pressure of the liquid retained in the annular siphon passageway is balanced by the capillary pressure of the liquid retained in the capillary inlet apertures, with the result that the passage of air bubbles through the capillary inlet apertures is prevented; whereby, upon addition of further liquid to the bowl, the siphoning operation immediately resumes.

4,527,468
APPARATUS FOR SEPARATING MULTIPLE WEBS OF DOCUMENTS INTO DISCRETE DOCUMENTS AND FORMING THE DISCRETE DOCUMENTS INTO PREDETERMINED BATCHES

Peter N. Piotroski, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,816
Int. Cl.[3] B41F 1/02
U.S. Cl. 101—2 49 Claims



1. A multi-web inserter system, comprising:

(a) a plurality of web module means for separating a web of forms into discrete forms, scanning said webs for information, and feeding said discrete forms for further processing;

(b) a plurality of web control means, each for controlling one of said web module means, in accordance with initialization signals and in response to first control signals received by each of said web control means, and for storing and retransmitting said information scanned from said webs;

(c) input means for input by an operator of information defining said initialization signals, said defining information including information defining information retransmitted by a first selected one of said web control means as control information;

(d) transport means, responsive to second control signals, for receiving first discrete forms from said first selected web module means and sequentially transporting said received forms to each remaining one of said web module means for receipt of discrete forms from selected ones of said remaining web module means in response to said first control signals, so that batches of forms may be assembled with said first discrete forms;

(e) supervisory control means for,

receiving said defining information and generating and transmitting said initialization signals in accordance therewith,

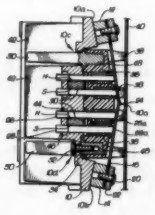
receiving said retransmitted control information from said first selected web module means and generating and transmitting said first control signals to said web control means in accordance therewith,

and generating and transmitting said second control signals to said transport means in accordance with said retransmitted control information as to properly assemble said batches.

4,527,469
DOT MATRIX PRINT ACTUATOR

Peter H. Wolf, Thousand Oaks; David C. Clarke, Canyon Country, and Heinz H. Hieber, Valencia, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Apr. 15, 1983, Ser. No. 485,199
Int. Cl.[3] B41J 3/12
U.S. Cl. 101—93.04 3 Claims



1. A stored energy type dot matrix print actuator, comprising:

a mounting assembly;

a plurality of elongated flat spring hammer elements secured to the mounting assembly in a spaced apart parallel relationship, wherein each hammer element includes a portion which is flexible back and forth relative to the mounting assembly; and

a plurality of magnetic circuits secured to the mounting assembly between the mounting assembly and the flexible portion of the hammer elements, each magnetic circuit including first and second spaced apart pole elements having pole faces which face a hammer element, a permanent magnet magnetically coupled to the pole elements to generate a magnetic field which flexes the hammer element toward the pole faces, and coil means for generating an electromagnetic field to overcome the magnetic field of the permanent magnet to thereby release the flexed hammer element, wherein the pole elements are positioned so that an associated hammer element contacts both pole faces when it is flexed to thereby reduce resonance of the hammer elements, wherein a first pole face is positioned near the free end of the associated hammer element to damp the fundamental mode of vibration of the hammer element, and a second pole face is positioned at a location corresponding to an anti-nodal point of the second mode of vibration of the hammer element to thereby damp said second mode of vibration.

4,527,470
PULLEY FOR BAND PRINTERS

Donald J. Smithbauer, Thousand Oaks; Daniel R. Lytle, Canoga Park, and Clifford Helms, Westlake Village, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 230,867, Feb. 2, 1981, abandoned. This application Dec. 20, 1984, Ser. No. 684,744
Int. Cl.[3] F16H 55/36; B41J 1/20, 1/60
U.S. Cl. 101—111 13 Claims

1. A band printer system comprising:

a pair of pulleys;

a cylindrical sleeve surrounding each pulley, the sleeve including a plurality of flexible downwardly angled

flanges extending around the circumference of the sleeve, and a lower rim extending substantially perpendicularly from the bottom of the sleeve,

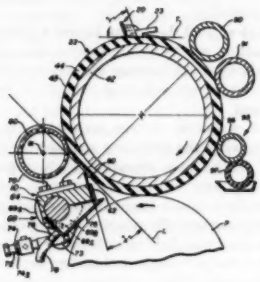
a print band having characters formed thereon, the print band being looped around the pulleys, whereby the print band will be forced downward along said flanges and against said rim; and

a printing assembly operating in conjunction with the print band to print characters on a printing medium.

4,527,471
DAMPENING FLUID REMOVAL DEVICE

Harold P. Dahlgren, 11 Turtle Creek, Dallas, Tex. 75204; James E. Taylor, 4129 Drowsy La., Dallas, Tex. 75233, and Dwight W. Peters, Rte. 1, Box 50N, Grapevine, Tex. 75051

Filed May 6, 1983, Ser. No. 492,402
Int. Cl.³ B41F *7/26, 7/36, 31/04*
U.S. Cl. 101—148 **16 Claims**

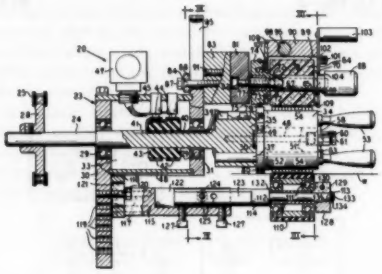


1. A method of inking a lithographic printing plate wherein dampening fluid having a viscosity of less than one poise, is applied to the printing plate to render hydrophilic, non-image areas, on the printing plate ink rejecting; and wherein ink, having a viscosity significantly greater than 10 poise, is applied by an inking roller, having a resilient surface, to oleophilic, image, areas on the printing plate at an inking nip, the improvement comprising the steps of: positioning a doctor blade having a leading edge and a trailing edge in pressure indented relation with the resilient surface on an inking form roller to engage ink and dampening fluid on the portion of the surface of the inking roller which has applied ink to the printing plate and before fresh ink is applied to the portion of the inking roller surface such that dampening fluid on the ink, carried by the resilient roller surface, impinges against a substantially flat metering surface on said doctor blade adjacent to the edge; urging both the metering edge and the trailing edge in a direction generally radially of the form roller to urge both the metering edge and the trailing edge into indented relation with the roller surface; resiliently supporting the doctor blade in a direction radially of the form roller to permit movement of the metering edge relative to the axis of the form roller; positioning the metering surface of the doctor blade at an angle relative to a line tangent to the roller surface to remove dampening fluid having a viscosity less than a predetermined viscosity from the surface of the inking roller and to leave ink having a viscosity greater than the predetermined viscosity on the surface of the inking roller; and applying fresh ink having a viscosity greater than said predetermined viscosity to the portion of the inker roller surface from which dampening fluid having a viscosity less than said predetermined viscosity has been removed.

4,527,472
EXCHANGEABLE PRINT HEAD HOT INK ROLL MARKER

Charles F. Davison, Brookfield, Ill., assignor to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Filed Sep. 26, 1983, Ser. No. 535,997
Int. Cl.³ B41F *13/44, 5/04;* **B41B** *1/18*
U.S. Cl. 101—219 **24 Claims**



1. A rotary head imprinter including a frame, and comprising:

a shaft rotatably supported by said frame and means for rotatably driving the shaft;

a print head mounting block carried by said shaft;

a print head and means for releasably securing said print head to said mounting block and thereby to said shaft;

a rotary inking roller and means for mounting the inking roller on said frame on an axis parallel to the axis of said shaft for rolling engagement with printing means carried by said print head;

a backing roller and means for mounting the backing roller on said frame on a rotary axis parallel to said shaft axis for supporting a workpiece for imprinting by the inked printing means carried by said printing head;

means for effecting adjustments of said inking roller mounting means and said backing roller mounting means radially relative to said shaft for enabling cooperation of said inking roller and said backing roller with printing heads of selected different diameters;

said means for mounting said backing roller on said frame comprising a non-rotating shaft, a tubular eccentric slidably engaged on said shaft and providing means for rotatably supporting said backing roller, said eccentric being selectively rotatably adjustable on said non-rotating shaft for adjusting said backing roller relative to said print head, and a combination adjusting knob and locking clamp on one end of said eccentric for locking the eccentric in any selected rotatably adjusted position on said non-rotating shaft;

means on said print head providing an axially extending and peripherally radially opening slot having an entrance at a front face of said print head for receiving printing means including a type holder, means for retaining the type holder against radial displacement from said slot, and means for releasably retaining said type holder against axial displacement from said slot; and

said type holder comprising a body adapted for mounting in said slot in the print head and having a cavity defined by a base wall and spaced end walls and adapted for supporting type bar means on said base wall between said end walls, means providing opposite type bar means retaining walls for said cavity, means for locking said type bar means in said cavity, at least one of said side walls being separable from said body to permit mounting and replacement of said type bar means in said cavity, and means for releasably retaining said one side wall in assembled relation with said body.

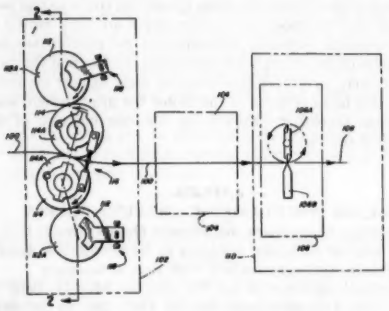
4,527,473
THERMAL ADJUSTMENT APPARATUS FOR ROTATING MACHINES

Francis J. Littleton, 182 McNair Rd., Buffalo, N.Y. 14221

Continuation-in-part of Ser. No. 282,596, Jul. 13, 1981, Pat. No. 4,426,897. This application Oct. 31, 1983, Ser. No. 546,836

Int. Cl.³ B41F *33/00*

U.S. Cl. 101—220 **17 Claims**



1. A printing press for performing a printing operation on a web of material passing therethrough, said printing press comprising:

frame means including first and second support members;

printing cylinder means having a longitudinal first axis and being mounted between said support members for rotation about said first axis;

backing cylinder means having a longitudinal second axis and being mounted between said support members for rotation about said second axis in synchronism with the rotation of said printing cylinder means, said backing cylinder means being disposed relative to said printing cylinder means so that said printing operation is performed on said web of material as the web passes between said printing cylinder means and said backing cylinder means and said printing cylinder means and backing cylinder means are rotated; and

thermal adjusting means connected to said first and second support members for setting the positioning and loading of said printing cylinder means relative to said backing cylinder means to account for rotational growth during operation of the printing press by adjusting the temperature of at least a portion of said first and second support members between said first and second axes, said thermal adjusting means comprising heater elements connected to said support members, means for selectively activating said heater elements, means for monitoring the speed of rotation of said cylinders, and means connected to said activating means and said monitoring means for synchronizing the operation of said activating means with the speed of rotation of said cylinders.

4,527,474
APPARATUS FOR IMPRESSION THROW-ON AND THROW-OFF AND, FOR CHANGING CYLINDERS, AND FOR CAUSING A LONG STROKE TO BE EXECUTED BY AN IMPRESSION CYLINDER OF A ROTARY GRAVURE PRESS

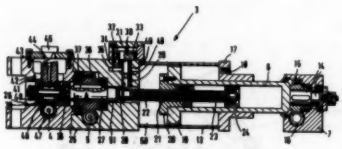
Herbert Lübke, Lienen, and Winfried Stascheit, Lengerich, both of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,698

Int. Cl.³ B41F *13/24*

U.S. Cl. 101—247 **9 Claims**

1. Apparatus for impression throw-on and throw-off and, as is necessary for changing cylinders, for causing a long stroke to be executed by an impression cylinder acting on the plate cylinder of a rotary gravure press, wherein the two journal bearings are each connected to a piston rod of the double acting piston-cylinder units serving to raise and lower the impression cylinder, characterised in that the piston rods (6) extending out of the cylinders (12) are rotatably but axially undisplaceably mounted in the journal bearings (7) and that, on the sides opposite to the piston rods (6) spindles (23) which are



screwed into the pistons (19) having screwthreads (21) are provided with unthreaded portions on which worm wheels (36) which are fixed with respect to the housing and in mesh with drivable worms (4) are secured against rotation but to allow limited axial displacement through a distance corresponding to the stroke between impression throw-on and throw-off.

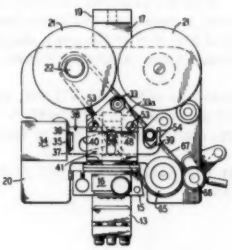
4,527,475
IMPRINTER PRINTHEAD AND SHUTTLE ASSEMBLY

Charles F. Davison, Brookfield, Ill., assignor to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Continuation of Ser. No. 351,430, Feb. 23, 1982, abandoned. This application May 4, 1983, Ser. No. 491,523

Int. Cl.³ B41F *5/00*

U.S. Cl. 101—316 **8 Claims**



1. In an imprinter having a reciprocating marker head with an upstanding head shaft, an opposed anvil, tape supply and take-up reels, a tape advance drive and a driven slotted shuttle having flat sides and rectangular cross-section reciprocating between two extreme positions, said head shaft carrying a cam follower riding in the shuttle slot to drive said marker head, and a second cam follower driven by the shuttle for driving said tape advance drive, said shuttle and said head shaft being received in and guided by a bearing block, the improvement of a means for eliminating binding of said shuttle at said extreme positions comprising:

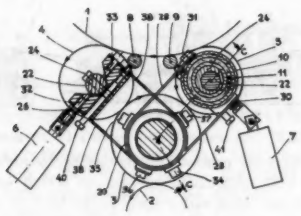
said head shaft having flat sides and a rectangular cross-section and having a rectangular slot receiving said shuttle;

and said bearing block having perpendicular rectangular intersecting slots respectively receiving and guiding said head shaft and said shuttle with respective flat surfaces of said head shaft and said shuttle sliding against each other in reciprocating perpendicular movement.

4,527,476
INKING MECHANISM FOR A PRINTING PRESS

Alain Ducournau, Basse Goulaine, and Francois Barras, Chapelle sur Erdre, both of France, assignors to Creusot-Loire, Paris, France

Filed May 11, 1983, Ser. No. 493,491
Claims priority, application France, Jun. 4, 1982, 82 09773
Int. Cl.³ B41F *31/30*
U.S. Cl. 101—352 **4 Claims**

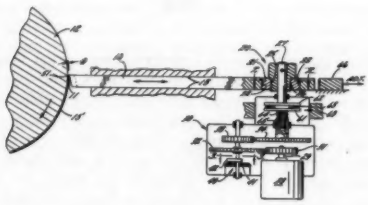


1. An improvement in printing presses in which at least one inking roller is placed in rolling contact with two other rollers one of which is a slide table, said inking roller being mounted pivotally about the axis of rotation of said slide table, wherein said inking roller (**4, 5**) is mounted rotatably about a shaft (**15**), said slide table (**3**) is supported by two fixed bearings (**18, 19**) each comprising a cylindrical outer face (**20, 21**), each end (**22, 23**) of said shaft (**15**) of said inking roller (**4, 5**) is connected to a corresponding one of said fixed bearings (**18, 19**) through the intermediary of a flexible metal band (**28, 29**) bent in U shape, the central region of said band partly surrounds the cylindrical face of said fixed bearing, being fixed thereto, and the two ends of which are fixed to the ends (**22, 23**) of said shaft (**15**) of said inking roller.

4,527,477
INK METERING DEVICE

Hans-Peter Galster, Seligenstadt, and Janko Despot, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 472,595, Mar. 7, 1983, abandoned. This application Oct. 19, 1983, Ser. No. 543,407
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211156
Int. Cl.³ B41F *31/00, 31/02, 31/04*
U.S. Cl. 101—365 **9 Claims**

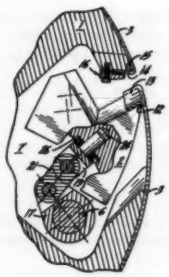


1. An ink metering arrangement including a fountain roller having a plurality of slides arranged edge-to-edge in respective column positions; the slides taken together extending the length of the fountain roller with each slide being adjustable so that its tip forms a gap with the roller thereby determining the rate of ink flow in the respective column position; each slide having a reversible motor with a first connection thereto for driving the slide over a limited range of movement including a slide reference position in which the gap is zero cutting off the flow, displacement sensing means having a second connection to the motor for producing an electrical output signal corresponding to the degree of displacement, means defining a stop for the displacement sensing means to establish a reference output condition, and means including a slip clutch interposed in at least one of said connections to said reversible motor so that when the motor is energized in a first direction the displacement sensing means is driven in the direction of the reference position against its stop and the slide is driven in the direction of its reference position against the roller so that both the slide and displacement sensing means are fully moved to their reference positions accompanied by relative slipping movement of the clutch notwithstanding the fact that the tip of the slide may have been shortened by wear against the roller and so that upon reversal of the motor the displacement sensing means thereafter provides an accurate measure of the opening at the gap.

4,527,478
MEANS FOR CLAMPING GRAVURE PLATES

Kurt Difflipp, Dietzenbach, and Henrich Ochs, Oberzell, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 493,734, May 11, 1983, abandoned. This application Dec. 20, 1983, Ser. No. 563,649
Int. Cl.³ B41F *21/00*
U.S. Cl. 101—415.1 **6 Claims**



1. In a printing cylinder of a rotary press, comprising,

a plate-clamping mechanism for tensioning and clamping a flexible printing plate on the printing cylinder, said plate-clamping mechanism being disposed in a peripheral cavity of said cylinder which extends along the length of said cylinder,

said cavity defining an edge which traverses the length of the cylinder along a path non-parallel with the axis of rotation of said cylinder and about which a first end of said flexible printing plate may be positioned and secured;

a clamping jaw disposed in said cavity for rotation about an axis parallel to said cavity edge;

means for pivoting said clamping jaw between a first plate clamping position and a second plate releasing position so as to allow printing plates to be secured on said printing cylinder when in said first clamping position and freed from said printing cylinder when in said second releasing position;

said clamping jaw having a leading edge for gripping the second end of said flexible printing plate, means for mounting said clamping jaw for pivotal movement such that the leading edge thereof extends along the entire length of the said cavity and is substantially coincident along its entire length with the curved surface formed by the continuation of the cylinder surface over said cavity when said clamping jaw is in both said first clamping position and said second releasing position so as to prevent creation of a void between the cylinder surface and the

printing plate when said clamping jaw is moved to said first clamping position to tension and clamp said flexible printing plate on said printing cylinder,

means including toggle linkage for pivoting said clamping jaw between said first and second positions,

spring means interposed between said clamping jaw and said toggle linkage said spring means being compressed between said clamping jaw and said toggle linkage when said jaw is moved to said first clamping position, the compression of said spring means being released to a state of substantially no compression when said clamping jaw is moved to said second position said toggle linkage being moved into a locked position when said clamping jaw is moved to said first position with said spring means biasing said clamping jaw in printing plate clamping condition while accommodating printing plates within a predetermined thickness tolerance.

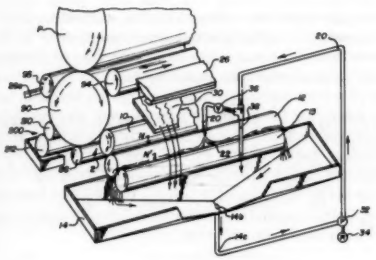
4,527,479
INK REMOVAL, CIRCULATING AND DISTRIBUTING SYSTEM

Harold P. Dahlgren, 4008 Buena Vista, Dallas, Tex. 75205; James E. Taylor, 4129 Drowsy La., Dallas, Tex. 75233, and Dwight W. Peters, Rte. 1, Box 50N, Grapevine, Tex. 76051

Continuation of Ser. No. 288,744, Jul. 31, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 583,486

Int. Cl.[3] **B41F** *7/36, 31/06;* **B41L** *25/12*

U.S. Cl. 101—450.1 **18 Claims**



1. A method of applying an emulsified printable mixture of ink and dampening fluid to a lithographic printing plate comprising the steps of: depositing an excess of the emulsified mixture of ink and dampening fluid in a central portion of a nip between a transfer roller and a metering member such that the emulsified mixture flows longitudinally of the nip toward opposite ends of the transfer roller; rotating the transfer roller to meter a thin film of the emulsified mixture between the metering member and the transfer roller onto the surface of the transfer roller; delivering the film from the transfer roller to the lithographic printing plate; maintaining flow of the mixture longitudinally of the nip to prevent accumulation of the dampening fluid adjacent said nip; causing the mixture to cascade over opposite ends of the transfer roller into opposite ends of a reservoir to remove the mixture from the nip adjacent opposite ends of the nip; depositing ink and dampening fluid remaining in a portion of the film of ink and dampening fluid which is not accepted by the lithographic printing plate into the reservoir; pumping the mixture which has cascaded over ends of the transfer roller and the portion not accepted by the printing plate from a central portion of the reservoir to form a homogeneous mixture and to deposit the homogeneous mixture in a central portion of the nip between the transfer roller and the metering member to circulate ink longitudinally of the nip and at a rate sufficient to prevent accumulation of dampening fluid separated from the ink in the nip as a result of pressure between the transfer roller and the metering member.

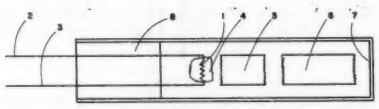
4,527,480
MEANS FOR THE DEACTIVATION OF ELECTRIC BLASTING CAPS

Gerald Carp, Potomac, Md., assignor to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Continuation-in-part of Ser. No. 947,974, Oct. 2, 1978, abandoned. This application Jul. 14, 1981, Ser. No. 283,250

Int. Cl.[3] **C06C** *7/00*

U.S. Cl. 102—202.1 **6 Claims**



1. A blasting cap comprising: an explosive charge; electrical ignition means to ignite said explosive charge, said ignition means comprising a normally continuous electric circuit; and nonexplosive means within said electrical ignition means to permanently disable said ignition means, said means to permanently disable said ignition means comprising a magnetic reed switch.

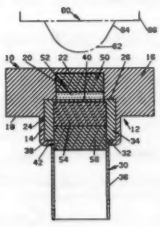
4,527,481
IMPACT SENSITIVE HIGH TEMPERATURE DETONATOR

John H. Evans, Lansdale, and Kenneth T. Sabotta, West Chester, both of Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 8, 1983, Ser. No. 483,134

Int. Cl.[3] **F42C** *19/08*

U.S. Cl. 102—204 **12 Claims**



1. An impact sensitive detonator comprising:

(a) a cylindrical casing which is closed at one end and open at the other end, the closed end having a thin striking surface which is capable of deformation without rupture when struck at forces up to 30 inch-pounds by a rounded firing pin having a circle radius of 0.1 inch;

(b) a primary explosive charge selected from the group consisting of lead azide and silver azide packed at high pressure adjacent to the closed end of the casing;

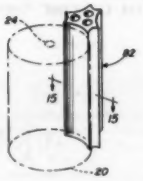
(c) a mass of finely divided refractory material selected from the group consisting of silicon carbide, powdered metals, aluminum oxide, sand and ground glass loosely charged under atmospheric pressure adjacent to and not mixed with said primary explosive charge; and

(d) an impact member extending transversely across said casing and forming with said casing a confined space for said primary explosive charge and said refractory material.

4,527,482
BLASTING CAP TO PRIMER ADAPTER

Frederick B. W. Hynes, 8778 E. Thunderbird Ct., Parker, Colo. 80134

Filed Oct. 23, 1981, Ser. No. 314,479
Int. Cl.³ F42D *1/08*; F42B *3/10*; C06C *5/04*
U.S. Cl. 102—331 3 Claims



1. An adapter for operably associating any of a plurality of different types of detonating means to any of a plurality of different types of primers comprising:

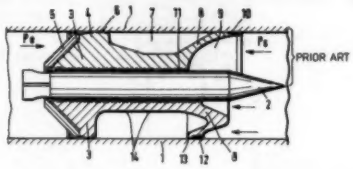
tunnel means through which a detonating cord forming a downline passes for coupling to a detonating means in a primer at any point along the length of the downline and

means for attaching the tunnel means onto the primer with the downline spaced from the primer to prevent direct detonation of the primer by the downline, said tunnel means and said attaching means including at least two arcuately shaped surfaces, any one of which may be brought into an abutting relationship with an outer circumferential surface of said primer, thereby to facilitate a connection of said attaching means and said tunnel means to said primer.

4,527,483
SABOT PROJECTILE GUIDE

Kurt Eichweber, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft für Feinmechanik und Electronic m.b.H., Hamburg, Fed. Rep. of Germany

Filed May 4, 1983, Ser. No. 491,498
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245540
Int. Cl.³ F42B *13/16*
U.S. Cl. 102—521 4 Claims



1. A sabot for guiding a projectile within a gun barrel comprising:

a sabot body encircling the projectile and including a rear barrel engaging portion and a front barrel engaging portion defining a cavity therebetween;

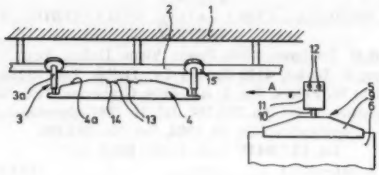
said front portion having a forward face including inner and outer surfaces, said inner surface extending axially forwardly and radially outwardly and said outer surface extending axially rearwardly and radially outwardly so fluid pressures on said inner and outer surfaces oppose one another while the sabot guided projectile passes through the gun barrel; and

said front portion including a peripheral gas bearing surface following said outer surface and facing the gun barrel so said front region is guided through the gun barrel by a gas bearing created between said gas bearing surface and the gun barrel, said gas bearing surface including an outer support gap surface and a plurality of forwardly opening ram zone pockets and fluidly coupling said cavity with a region forward of said forward face outer surface, said ram zone having a trapezoidal cross-sectional shape when taken along a radial plane.

4,527,484
CONVEYOR APPARATUS, PARTICULARLY FOR SUSPENSION CONVEYANCE

Gustav G. Veith, Frasdorf; Rolf Schönenberger, Landsberg; Udo Thumser, Baldham, and Georg Ziegler, Unterhaching, all of Fed. Rep. of Germany, assignors to Veit GmbH & Co., Landsberg, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,749
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1982, 3221646
Int. Cl.³ B61K *1/00*
U.S. Cl. 104—89 20 Claims

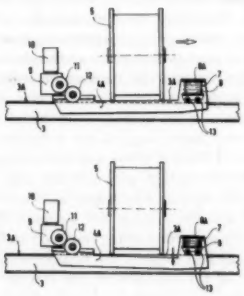


1. Conveyor apparatus, particularly for intraplant suspension conveyance, comprising a conveyor rail system for the conveyance therealong in a longitudinal direction of a bridge-type carrier suspended at both ends from said conveyor system by means of rollers connected to said carrier by brackets, and container means for the goods to be conveyed, said container means being suspended from said carrier by means of a carrier head releasably engaging said carrier from above, characterized in that said carrier head (5) is adapted to be released from said carrier (4) by being lifted relatively thereto and laterally withdrawn in the longitudinal direction relative to said carrier without interference with said brackets.

4,527,485
SYSTEM FOR TRANSPORTING HEAVY CYLINDRICAL OBJECTS IN A WORKSHOP

René Lemaitre, Gennevilliers, France, assignor to Les Cables De Lyon, Clichy, France

Filed Nov. 17, 1982, Ser. No. 442,330
Claims priority, application France, Nov. 20, 1981, 81 21738
Int. Cl.³ B61B *13/06*
U.S. Cl. 104—118 2 Claims



1. A system for transporting heavy cylindrical objects on a

carriage, said carriage including means for supporting said carriage for longitudinal movement within and guided along a pit formed in the workshop floor, and motor means for driving said carriage along said pit from a loading station to an unloading station, said system including:

a channel rail lining the bottom and side of the pit;

an upstanding rail located within the channel rail symmetrically about the plane of symmetry of the channel rail and being narrower than the channel rail thereby leaving a longitudinally extending gap on either side of the upstanding rail between the upstanding rail and the channel rail, the upstanding rail having a plane top surface level with the floor;

two longitudinal girders integral with the carriage, said girders being narrow and inserted respectively in said longitudinal gaps, said carriage girders being flat; and

means for raising and lowering said longitudinal girders along at least a part of their length between lowered position in which said part is no higher than the floor level and a raised position in which said part of their length is above the floor level;

and wherein the longitudinal girders mount drive wheels in contact with the workshop floor at one of their ends forming a pivot axis for the girders at that end, and wherein said means for raising and lowering said carriage includes means connected to the other ends of said girders for raising those ends of said girders relative to the ends mounting said drive wheels;

whereby, with the girders in lowered position, heavy cylindrical objects may be efficiently and easily loaded onto said carraige by rolling them about their axis over a carriage girder with their axis parallel to the girder, while said girders are at raised position, said cylindrical objects may be held onto said carriage without danger of falling off during transport.

4,527,486

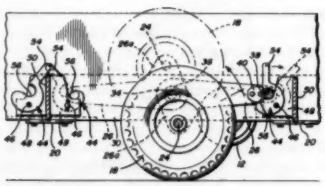
VEHICLE WITH SELECTIVELY USEABLE WHEEL SETS

William R. Baird, and Billy C. Baird, both of Sturgis, Ky., assignors to Saturn Machine & Welding Co., Inc., Sturgis, Ky.

Filed Jun. 10, 1983, Ser. No. 503,884

Int. Cl.³ B61F *13/00*; **B61D** *11/02*

U.S. Cl. 105—215 C **16 Claims**



1. For use in a wheeled vehicle such as a mine supply car, to provide the vehicle with selectively useable wheel sets whereby the vehicle may be converted for use in alternative operating modes by raising and lowering one of the wheels sets between operative and inoperative positions, the combination comprising a frame means on each side of the vehicle for mounting the wheels of said one set, a pivot arm assembly for each wheel of said one set, an axle attaching each wheel of said one set to the respective pivot arm assembly, means pivotally mounting each pivot arm assembly on the frame means for swinging movement about a pivot axis, and a pair of releasable latch devices on the frame means for each pivot arm assembly, the respective latch devices being selectively engageable by the pivot arm assembly for retaining the assembly in selected positions, the latch devices being angularly displaced in relation to the pivot axis of the assembly and the wheel axle being offset from the pivot axis for providing vertical displacement of the associated wheel between the operative and inoperative positions by swinging movement of the pivot arm assembly from engagement with one of the latch devices into engagement with the other of the latch devices, wherein the latch devices of each pair are located in a substantially horizontal plane on opposite sides of the pivot axis of the associated pivot arm assembly, for the assembly to swing through substantially 180° between positions engaging the respective latch devices each pivot arm assembly comprising a pair of pivot arms having pivot pins at one end thereof defining the pivot axis and pivotally connecting the arms to respective inner and outer side frame members of the frame means, a latch formation at the other end of the arms for engagement with the respective latch devices, and wherein the axle of the associated wheel is connected between the arms in vertically offset relation to the respective ends.

4,527,487

SUSPENSION AND COUPLING DEVICE BETWEEN A BOGIE FRAME AND AN AXLE BOX

Georges Pinto, Chagny, France, assignor to Creusot-Loire, Paris, France

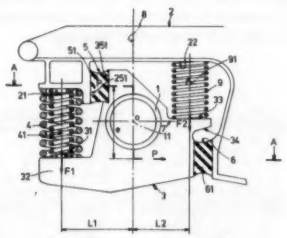
PCT No. PCT/FR82/00102, § 371 Date Feb. 17, 1983, § 102(e) Date Feb. 17, 1983, PCT Pub. No. WO82/04423, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 18, 1982, Ser. No. 467,560

Claims priority, application France, Jun. 19, 1981, 81 12085

Int. Cl.³ B61F *5/30*

U.S. Cl. 105—223 **8 Claims**



1. Device for the suspension and coupling of a bogie chassis to an axle box, comprising a vertical suspension spring through which the bogie chassis is supported on the axle box, thereby creating a rotary torque on said box, and comprising two couplings mounted spaced in altitude between said bogie chassis and said axle box so as to be compressed when said axle box tends to rotate under the effect of the rotary torque, wherein said rotary torque is provided by two suspension springs of the helicoidal spring type, mounted on each side of the vertical plane passing through the axis of an axle, and each coupling is constituted by at least one elastic stud forming a monoblock part whose terminal sections are fixed to a support surface of said bogie chassis and to a support surface of said axle box so that the compressive force due to said suspension springs results in a low shear strength in the vertical direction.

4,527,488

COKE OVEN CHARGING CAR

Carl Lindgren, Glenshaw, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1983, Ser. No. 488,776

Int. Cl.³ B61D *7/06, 7/00, 17/00*

U.S. Cl. 105—247 **6 Claims**

1. A coke oven charging car comprising:

(a) first and second laterally spaced front wheel housings, each of said front wheel housings being carried by one or more wheels mounted on axles to be moveable in a forward or rearward direction;

(b) first and second laterally spaced rear wheel housings,

each of said rear wheel housings being carried by one or more wheels mounted on axles to be moveable in a forward or rearward direction;

(c) lower front and rear parallel transverse beams longitudinally spaced from one another and interposed between said front and rear wheel housings;

(d) upper front and rear parallel transverse beams longitudinally spaced from one another and vertically spaced above and superimposed, respectively, over said lower front and rear parallel transverse beams;

(e) a pair of lower laterally spaced longitudinal beams connecting said lower front and rear transverse beams;

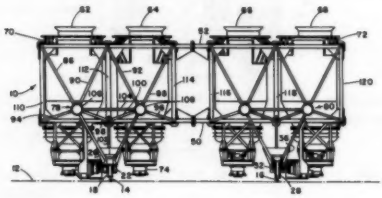
(f) a pair of upper laterally spaced longitudinal beams connecting said upper front and rear transverse beams;

(g) at least one gravity operated, bottom discharging hopper interposed between said upper and lower front and rear transverse beams;

(h) first and second front truss structures interconnecting, respectively, the first front wheel housing and the upper and lower front transverse beams and the second front wheel housing and the upper and lower front transverse beams; and

(i) first and second rear truss structures interconnecting, respectively, the first rear wheel housing and the upper and lower rear transverse beams and the second rear wheel housing and the upper and lower rear transverse beams, at least one of said truss structures comprising:

(1) a first member connected at its upper end outwardly on the upper front transverse beam and extending inwardly and downwardly therefrom to be connected at its lower end to the first front wheel housing;



(2) a second member connected at its upper end inwardly on the upper front transverse beam and extending outwardly and downwardly therefrom to be connected at its lower end to the first front wheel housing;

(3) a third member connected to the upper front transverse beam at its upper end between said first and second members and extending outwardly and downwardly therefrom to be medially connected to the first member;

(4) a fourth member connected to the upper front transverse beam at its upper end between said first and second members and extending inwardly and downwardly therefrom to be medially connected to the second member;

(5) a fifth member connected at its lower end outwardly on the lower front transverse beam and extending inwardly and upwardly, therefrom, to be medially connected to the first member;

(6) a sixth member connected at its lower end inwardly on the lower front transverse beam and extending outwardly and upwardly therefrom to be medially connected to the second member;

(7) a seventh member connected at its lower end to the lower front transverse beam between said fifth and sixth members and extending outwardly and upwardly, therefrom, to be medially connected to the first member at its upper end;

(8) an eighth member connected at its lower end to the lower front transverse beam between said fifth and sixth members and extending outwardly and upwardly therefrom to be medially connected to the second member at its upper end;

(9) a ninth member connected at its upper end to the lower front transverse beam and extending downwardly, therefrom, to be connected to the first wheel housing; and

(10) a tenth member connecting medially at its one end to the first member and connecting medially at its other end to the second member.

4,527,489

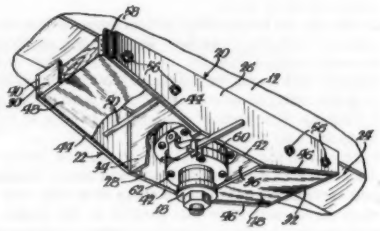
RAILROAD TANK CAR SKID CONSTRUCTION

Lawrence J. Schlink, Highland, Ind., assignor to Union Tank Car Company, East Chicago, Ind.

Filed May 2, 1983, Ser. No. 490,792

Int. Cl.³ B61D *5/00*

U.S. Cl. 105—358 **16 Claims**



1. In a railway tank car having an appurtenance extending downwardly from a generally annular body portion thereof, an improved skid arrangement; comprising:

(a) a reinforcing plate means secured to the underside of said body portion extending longitudinally on either side of said appurtenance;

(b) a skid frame structure suspended from said reinforcing plate means in a surrounding relationship to said appurtenance, said skid frame structure defined by a pair of longitudinally extending side plates having vertical extents which decrease as said side plates extend longitudinally outward from said skid frame structure so as to define a ramped lower surface and a pair of transversely extending end plates extending between and secured to the outer ends of said side plates so as to define a box-type structure surrounding said appurtenance, said side plates having upper edges transversely spaced outwardly of said reinforcing plate means, said end plates being rigidly secured to said reinforcing plate means such that said upper edges of said side plates and the upper edges of said end plates are spaced a short distance from said body portion; and

(c) a lightweight filler means having a high compressive strength secured within the confines of said skid frame structure, said filler means having an upper surface which is positioned in contact with said reinforcing plate means so as to transmit impact forces applied to said skid arrangement uniformly to said reinforcing plate means and into said body portion.

4,527,490

KNOCKDOWN SHELVING ASSEMBLY

Larry J. Tipton, Florissant, and Larry D. Alfermann, Washington, both of Mo., assignors to Bastian Advanced Systems, Inc., St. Louis, Mo.

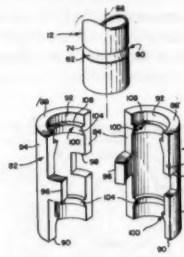
Filed May 20, 1983, Ser. No. 496,643

Int. Cl.³ A47B *3/00*

U.S. Cl. 108—111 **16 Claims**

1. A knockdown shelving assembly comprising a shelf member having corner supports secured thereto at each corner thereof, each said corner support including an opening having

an annular edge, said opening being adapted to receive an elongated shelf supporting post, each said corner support including gusset means secured to said shelf member at each corner thereof, said gusset means including a crown plate spaced from said shelf member and extending substantially parallel thereto, said opening being formed in said crown plate,



and an expandable shelf supporting post within said opening for limited longitudinal movement relative to said shelf supporting post, said shelf supporting post including cam means operative upon longitudinal movement of said supporting sleeve means to engage and expand said expandable shelf supporting sleeve means outwardly from said shelf supporting post against the annular edge of said opening.

4,527,491

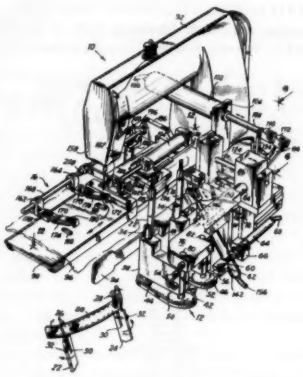
BELT LOOP SETTING SYSTEM

Charles Block, North Bellmore, and Leon Mintz, Syosset, both of N.Y., assignors to Joseph Galkin Corporation, Hicksville, N.Y.

Continuation-in-part of Ser. No. 206,790, Nov. 14, 1980, Pat. No. 4,389,957. This application Jun. 27, 1983, Ser. No. 508,447

Int. Cl.[3] **D05B** *3/20, 23/00*

U.S. Cl. 112—104 **2 Claims**



1. A loop setting system comprising, in combination:

a first pair of pin members extending substantially in a first direction,

a second pair of pin members spaced from said first pair of pin members and extending substantially parallel with respect to said first direction,

said first and second pairs of pin members each defining respective first and second slots therebetween capable of receiving therein relatively remote portions of material to be manipulated to form a folded configuration capable of joinder with other material,

means for arcuately moving at least one pair of pin members, thereby accomplishing said folding manipulation and positioning the formed configuration with respect to a reference plane, said first pair of pin members extending substantially in a first direction a predetermined distance from a first reference axis, said second pair of pin members spaced from said first pair of pin members and extending substantially parallel with respect to said first direction a predetermined distance from a second reference axis, means for arcuately moving said first and second pairs of pin members about said respective first and second axes, thereby accomplishing said folding manipulation and positioning the formed configuration with respect to a said reference plane, said first pair of pin members being disposed such that all points along a line joining said first pair of pin members are spaced a pre-determined distance from said first axis, at least one pair of pin members having an axis of rotation spaced a predetermined distance from and substantially parallel to a reference axis, means for rotating said one pair about said axis of rotation, means for simultaneously arcuately moving said one pair about said reference axis, and means for positioning said one pair with respect to said reference plane, thereby accomplishing said folding manipulation and positioning the formed configuration with respect to said reference plane.

4,527,492

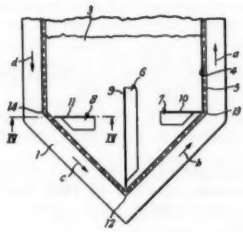
JIG FOR STITCHING FABRIC LAYERS IN A SEWING MACHINE

Peter R. Gill, Leeds, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,318

Int. Cl.[3] **D05B** *21/00*

U.S. Cl. 112—121.12 **4 Claims**

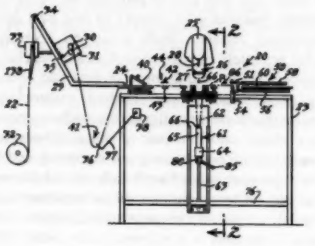


1. A jig for use in the stitching together of two layers of material along a stitching line that defines a corner, the jig comprising a lower plate having a part engageable with guide means on the sewing machine and having a slot through which stitching may be effected, the slot including a corner and defining the stitching line, an upper plate cooperable with the lower plate and fulling means between the lower and upper plates, the fulling means having an upstanding member for defining a pleat in a fabric layer placed over the fulling means, the member being positioned so that the pleat extends towards the slot along a line that intersects the slot at a location lying ahead of the corner of the slot.

4,527,493
FABRIC BAND MAKING MACHINE

John P. Sallee, Manson Pike, Rte. #10, Murfreesboro, Tenn. 37130, and Dennis Liggett, P.O. Box 329, Goodlettsville, Tenn. 37072

Filed Apr. 12, 1983, Ser. No. 484,139
Int. Cl.³ D05B *23/00*
U.S. Cl. 112—121.27 **18 Claims**



1. An apparatus for making a band from an elongated strip of flexible material comprising:

(a) a securing station for securing two end postions of a strip of flexible material together,

(b) means for positioning an elongated strip of flexible material having a lead end in a measuring path below said securing station,

(c) a measure rod extending transversely of said measuring path,

(d) guide means operatively connected to said measure rod for guiding said measure rod in a vertical linear path from an upper inoperative position between said sewing station and said measuring path and a lower operative position in which said measure rod deflects the strip downward from said measuring path a pre-determined distance,

(e) drive means for moving said measure rod along said vertical linear path,

(f) adjustment means for varying the downward distance said measure rod travels,

(g) knife means for severing the measured portion of the strip from the remaining portion of the strip, to form a loop of the flexible material,

(h) means for clamping the end portions of the loop and for placing said end portions in said securing station,

(i) ejection means for moving the loop from said securing station after said end portions have been secured.

4,527,494
BOBBIN CASE POSITION PLATE ADJUSTMENT MECHANISM

William L. Herron, Elizabeth, and John D. Speckman, Colonia, both of N.J., assignors to The Singer Company, Stamford, Conn.

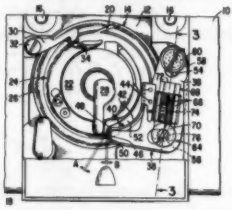
Continuation-in-part of Ser. No. 4,117, Jan. 17, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,415
Int. Cl.³ D05B *57/26, 57/08*
U.S. Cl. 112—231 **7 Claims**

1. In a sewing machine comprising a bed, a loop taker rotating on a vertical axis within the bed, a fixed bobbin case rotation restraining member fastened to the bed, and a bobbin case contained within said loop taker, the bobbin case containing a bobbin carrying a supply of bobbin thread and having an outwardly facing wall containing a depression and an abutment surface located on the wall distant from the depression, the depression entrapping the fixed bobbin case rotation restraining member to prevent the bobbin case from partaking of rotation with the loop taker:

an adjustable bobbin case retainer;

a second rotation restraining member carried on the adjustable bobbin case retainer and cooperating with the fixed rotation restraining member to prevent rotation of the bobbin case, the adjustable bobbin case retainer comprising a base plate containing a first elongated slot and a second elongated slot near opposite extremities of the base plate, the slots being elongated in directions which are substantially perpendicular to each other;

first means for pivotally fastening the base plate to the sewing machine bed through the first of the slots to pivot the second rotation restraining member toward and away from the abutment surface, the first slot being elongated in a direction substantially parallel to the abutment surface to allow movement of the retainer in a direction substantially parallel to the abutment surface;



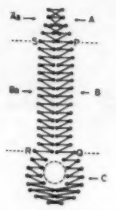
second means cooperating with and closely fitting against the sides of the second of the elongated slots for eccentrically adjusting the distance of the base plate relative to the loop taker, whereby the distance between the bobbin case and the second rotation restraining member carried on the base plate may be adjusted in a direction generally parallel to the direction of the abutment surface by the eccentric adjusting means and the pivotal fastening means; and

third means cooperating with the second means and the sides of the second elongated slot to lock the rotation restraining member carried on the base plate at predetermined points at different perpendicular distances from the abutment surface.

4,527,495
BUTTONHOLE STITCHING PROCESS

Hideaki Takenoya, and Eiichi Shomura, both of Hachioji, Japan, assignors to Janome Sewing Machine Industry Co., Inc., Japan

Filed Apr. 17, 1984, Ser. No. 601,202
Claims priority, application Japan, Apr. 18, 1983, 58-67067
Int. Cl.³ D05B *3/06;* A41F *1/02*
U.S. Cl. 112—264.1 **3 Claims**



1. Process for stitching a buttonhole of a type consisting of at least three different patterns of stitches which are sequentially formed in the forward and reverse directions by means of a zigzag sewing machine, two of said patterns being formed with a predetermined number of stitches respectively and the other one being formed with an optional number of stitches, comprising the steps of continuously producing in one of said feeding directions a first half of a first pattern of a predeter-

mined number of stitches and a first half of a second pattern which may be of an optional number of stitches; continuously producing in said one and the opposite directions a third pattern of a predetermined number of stitches and a second half of said second pattern until said second half of said second pattern comes to the stiches at the junction between the first halves of said first and second patterns; and producing a second half of said first pattern in the opposite direction; wherein the last one stitch of said first half of said first pattern is extended transversely of the feeding direction to a point which is located adjacent to the junction between said second halves of said second and first patterns.

4,527,496

SEWING MACHINE WITH A SPOOLING MECHANISM

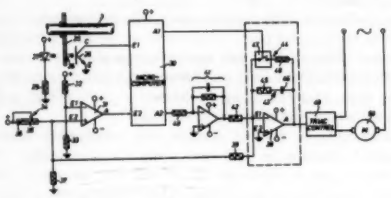
Patrice J. Kemmel, Stutensee, Fed. Rep. of Germany, assignor to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,708

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306075

Int. Cl.[3] **D05B** *59/00*

U.S. Cl. 112—279 **5 Claims**



1. A sewing machine comprising:

a sewing motor;

a rotary part connected to said motor for rotation by said motor;

a rotatable armshaft for performing a sewing operation;

coupling means connected between said motor and said armshaft for engaging said motor to said armshaft to rotate said armshaft and for disengaging said motor from said armshaft;

speed control means connected to said motor for variably controlling the speed of said motor, said speed control means including an operational amplifier having a feedback circuit;

a pulse generator associated with said armshaft for generating pulses at a rate corresponding to an actual speed of said armshaft, said pulse generator connected to said speed control means for supplying said pules to said speed control means;

a starter resistor connected to said control means for providing a voltage corresponding to a desired speed of said armshaft; and

a spooling mechanism engageable with said rotary part for spooling a thread;

said feedback circuit of said operational amplifier comprising two resistance members connected in parallel to said operational amplifier and switch means connected to at least one of said resistance members for disconnecting one of said resistance members, said switch means connected to said pulse generator and responsive to said pulse generator for disconnecting said one of said resistance members.

4,527,497

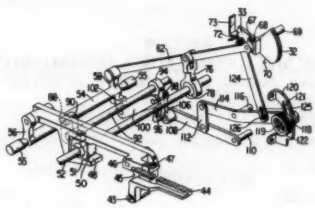
DIFFERENTIAL FEED SYSTEM WITH SAFETY DEVICE

Alexander F. Kerr, Hazlet, N.J., and Hiroshi Kiyoshima, Utsunomiya, Japan, assignors to The Singer Company, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,313

Int. Cl.[3] **D05B** *27/08*

U.S. Cl. 112—313 **4 Claims**



1. A differential feed system for feeding a work material in a longitudinal direction in a sewing machine having a frame, said feed system comprising:

a main feed bar extending in said sewing machine frame in said longitudinal direction, said main feed bar being formed with a fork substantially midway thereof;

a first feed dog supported at one end of said main feed bar;

a feed shaft extending laterally of said main feed bar adjacent the other end thereof, said feed shaft having a first arm extending therefrom substantially normal to said main feed bar and pivotally connected to said other end of said main feed bar, said feed shaft having a second arm and a third arm extending therefrom;

a main shaft extending substantially parallel to said feed shaft and through said fork of said main feed bar;

a first cam supported for rotation with said main shaft and situated in said fork of said main feed bar for urging said first feed dog thereon in rising and falling motion;

a feed adjusting link having one end pivotably attached to said second arm of said feed shaft and extending in a longitudinal direction in said sewing machine frame beyond said main shaft to adjacent an external surface of said frame;

a second cam supported for rotation with said main shaft;

means for connecting said second cam with said feed adjusting link for imparting oscillating motion thereto;

a feed regulator connected to the other end of said feed adjusting link for converting a selectable degree of the oscillating motion thereof to longitudinal motion creating a oscillating motion of said feed shaft operating in synchronism with said first cam on said main shaft to provide a feed and return motion to said main feed bar in alternate synchronism with said rising and falling motion thereof;

a dial having a portion protruding exteriorly of said sewing machine frame for selective manipulation by an operator and connected to said feed regulator for adjustment of the same;

a differential feed shaft supported by said sewing machine frame parallel to said feed shaft and spaced therefrom;

a member connected to said differential feed shaft, said member having a slot therein extending substantially radially to the differential feed shaft;

a link having one end pivotably connected to said third arm and the other end adjacent said curved slot of said member;

a pin fixed to said other end of said link and extending through said slot of said member for imparting oscillation to said differential feed shaft in an amount determined by the position of said pin in said curved slot;

means for moving said pin to a selected position in said curved slot to regulate the oscillation of said differential feed shaft;

an auxiliary feed bar carried by said main feed bar for rising and falling motion therewith but for independent longitudinal motion with respect thereto;

a second feed dog carried by an end of said auxiliary feed bar in front of said first feed dog;

a crank supported on said differential feed shaft; and,

means connecting said crank to said auxiliary feed bar for converting the oscillations of said differential feed shaft to longitudinal feeding motion of said second feed dog.

4,527,498

WORK-FEED MECHANISM FOR A SEWING MACHINE

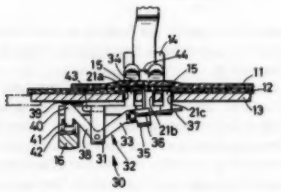
Souichi Tazawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 12, 1984, Ser. No. 589,275

Claims priority, application Japan, Mar. 18, 1983, 58-40063[U]

Int. Cl.³ D05B *27/02*

U.S. Cl. 112—323 **9 Claims**



1. A work-feed mechanism for a sewing machine having a sewing needle and a throat plate with an elongate slot, comprising:

movable means including a feed dog operable through said slot to feed a workpiece on said throat plate, and a feed bar carrying said feed dog;

means for imparting a four-motion movement to said movable means;

an actuating lever pivotably supported on said movable means and having two arms;

a lower feed needle supported on one of said two arms and disposed to be movable through said slot between its lower and upper positions with its upper end rising and falling from the upper surface of said throat plate upon pivotal movements of said actuating lever;

engaging means provided on the lower surface of said throat plate and located opposite to the other of said two arms for abutting contact with the same upon upward movement of said movable means; and

biasing means for urging said actuating lever in a direction to cause said lower feed needle to move toward said lower position thereof.

4,527,499

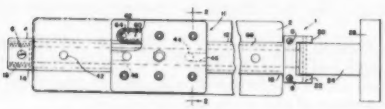
ADJUSTABLE MAST STEP

Richard W. Grant, and Ronald D. Sciulli, both of Honolulu, Hi., assignors to Atecs Corporation, Honolulu, Hi.

Filed May 2, 1983, Ser. No. 490,472

Int. Cl.³ B63H *9/06*

U.S. Cl. 114—39 **15 Claims**



7. Adjustable step apparatus comprising a track, a traveler connected to the track for moving along the track, a step connected to the traveler, a slider mounted for movement along the track, first, second and third openings in the traveler, the track and the slider respectively, detents positioned in the second openings within the track and movable in a first direction to engage first openings in the traveler and movable in a second direction to engage third openings in the slider and a shifting means connected to the slider for sliding the slider with respect to the track and selectively aligning and misaligning the third openings with the second openings.

4,527,500

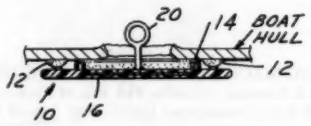
SEALING MAT FOR HULL BREACHES

Erwin J. Fuerst, 1183 N. River Rd., St. Clair, Mich. 48079

Filed Aug. 11, 1983, Ser. No. 521,996

Int. Cl.³ B63B *43/16*

U.S. Cl. 114—229 **1 Claim**



1. A safety mat for temporary emergency closure of a hull breach of a boat which comprises:

(a) a relatively flat mat of pliable material flexible in a manner to conform to a hull curved in directions normal to each other,

(b) a continuous, closed sealing rim of flexible material raised from the general plane of one side of the mat a predetermined distance from said mat to surround and conform to a hull surface outside a hull breach below the water line of the boat, said rim being positioned a predetermined distance within the margins of the mat,

(c) a pluraity of flexible suction cups arranged in closely spaced relation on said mat along the said sealing rim outside, and on the same side of said mat, as said rim and around and between said rim and the margins of the mat to secure the mat and the sealing rim to a hull surrounding a breach, and

(d) a flexible tongue extending from the edge of said mat having a slot to receive the handle intermediate bridged suction cups, said tongue and said bridged suction cups serving to facilitate initial location of said mat adjacent a hull breach.

4,527,501

MOORING SYSTEM CARRIED OUTBOARD BY A RIGID ARM ON A VESSEL

Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings, Inc., Marly, Switzerland

Filed Jul. 6, 1983, Ser. No. 511,197

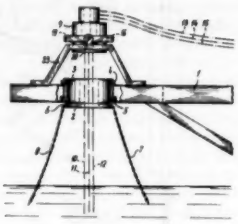
Claims priority, application Netherlands, Jul. 7, 1982, 8202738

Int. Cl.³ B63B *21/50*

U.S. Cl. 114—230 **1 Claim**

1. In a mooring system comprising a vessel, an arm rigidly connected to said vessel and extending outboard, said arm carrying a ring-shaped body having a vertical axis, said body being rotatable with respect to said arm about said vertical axis, anchor chains connected to said ring-shaped body, said ring-shaped body having a central opening through which extend conduits running downward from a rotatable conduit coupling mounted above said central opening on said arm; the improvement in which said conduits are connected to said conduit coupling so as to follow the movements of the coupling, a rigid frame rigidly mounted on said arm and extending above said ring-shaped body and its central opening, said frame at opposite sides of the central opening carrying pivot pins on which the outer member of a cardan joint rotates about a first

horizontal axis, said outer member carrying pivot pins on which is mounted, for rotation about a second horizontal axis perpendicular to said first axis, that part of the conduit coupling to which are connected the downwardly extending conduits, the cardan joint supporting the conduit coupling for rocking movement about said horizontal axes but preventing



movement of the conduit coupling along said vertical axis relative to said arm, the central opening of the ring-shaped body being sufficiently large that, during movements of the rigid arm of the vessel, the said downwardly extending conduits are kept substantially free from contact with the ring-shaped body.

4,527,502

EXPELLING MECHANISM FOR DISCHARGE TUBES AND DRAIN TUBES OF SUBMARINES

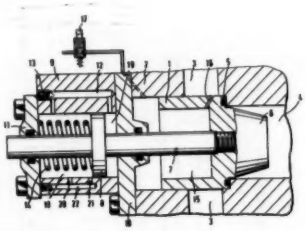
Josef Schmitt, Dänischenhagen, Fed. Rep. of Germany, assignor to Krup MaK Maschinenbau GmbH, Kiel, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,530

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3322020

Int. Cl.[3] **F16K** *31/143*

U.S. Cl. 114—319 **10 Claims**



1. An expelling mechanism adapted for use with discharge tubes and drain tubes of submarines for ejecting a weapon by means of compressed air,

comprising in combination

a chamber formed with an outlet opening, and being adapted to substantially communicate selectively with a storage container holding compressed gas,

a discharge valve movable towards said opening in a closing direction, and away therefrom in an opening direction at a selectable opening velocity,

hydraulic control means for controlling the movement of said discharge valve including

a cylinder adapted to be filled with hydraulic fluid,

a piston reciprocally movable along a stroke within said cylinder along said opening and closing directions, respectively, and partitioning said cylinder into two cylinder chambers,

overflow means operable during each of said directions, and establishing communication between said cylinder chambers, and

connecting means connecting said discharge valve with said hydraulic control means, said outlet opening and said overflow means having cross-sections variable in dependence of said stroke, respectively, so that the outlet opening increases as the discharge valve moves in the opening direction, the opening velocity of said discharge valve is controllable, and different respective cross-sections of said overflow means operable during each of said directions are settable in dependence of said stroke, irrespective of whether the piston moves in an opening direction on in a closing direction.

4,527,503

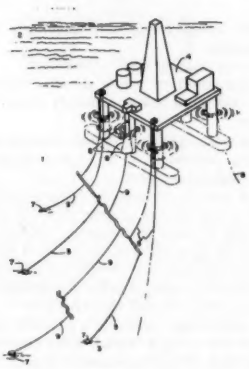
SPAR BUOY ESCAPE SYSTEM FOR OFFSHORE PLATFORMS

Ronald F. Connelly, Ventura, Calif., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 473,823, Mar. 9, 1983, abandoned. This application Oct. 29, 1984, Ser. No. 665,095

Int. Cl.[3] **B63B** *23/00*

U.S. Cl. 114—365 **3 Claims**



1. A safety system for personnel occupying an offshore platform which protects and isolates the personnel from life-threatening weather and allows escape of personnel from the platform when the platform is unstable and no longer safe, including,

an offshore platform supporting personnel above the surface while it extends below the surface of the sea,

a floatable escape vessel in the form of a spar buoy having a relatively long hollow and relatively narrow tubular upper portion and a conical hollow lower portion with the narrowest part of the lower portion being located where it joins the upper portion and when the vessel is mounted on the platform the bottom of the upper portion and the top of the lower portion being approximately at sea level and when dismounted from the platform the vessel is ballast controllable such that the upper portion presents a small frontal area to the wind forces and a substantial amount of the entire vessel is below sea level to provide stability as a floating vessel and the top of the upper portion being openable and including means by which the personnel may enter the top portion from the platform and travel to the lower portion and the escape vessel being mounted on the platform at a location from which it will be dismounted into the sea after receiving the personnel,

a compartment in the lower portion of the spar buoy,

a winch mounted in the compartment,

an anchor located on the seabed,

and a tether connecting the anchor and the winch operated within the spar buoy to control the length of the tether between the anchor and the winch to permit the spar buoy to float at the surface of the sea above the anchor.

4,527,504

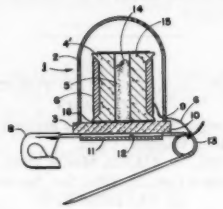
SAFETY DEVICE TO QUICKLY LOCATE A DROWNING VICTIM

Arlie Byerley, 4010 Joliet Rd., Lyons, Ill. 60534

Continuation-in-part of Ser. No. 211,075, Nov. 28, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,986

Int. Cl.³ G08B *1/00*

U.S. Cl. 116—211 **12 Claims**



1. A safety device for quickly locating a drowning victim which comprises:

a hollow cap member open at one end;

a spool composed of a low density material floatable in water, said spool being releasably placed within said cap member;

a thread wound on said spool with the free end of the thread extending outwardly so as to pass freely from the open end of said cap member;

a solid but very water-soluble closure member fitting over the open end of said cap member and being tightly adhered thereto, said cap member having a small opening adjacent its open end for the outward passage of the free end of the thread clear of said closure member;

a water-soluble marking dye for discoloring water contained on or within said spool member; and

means to attach said device to a potential drowning victim, the free end of said thread being tied to said attaching means which in turn is joined to one of said cap and closure members.

4,527,505

DEVICE FOR CONVEYING A FLEXIBLE TUBING AND A FLUID MEDIUM CONTAINED THEREIN

Reinhold Becker, Wiesbaden, and Helmut Sattler, Wiesbaden-Schierstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,422

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219525

Int. Cl.³ B05C *7/04*

U.S. Cl. 118—44 **20 Claims**

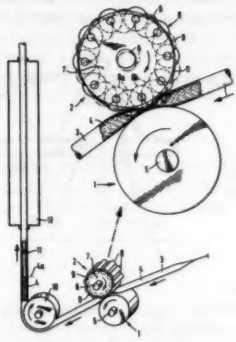
1. A device for conveying a flexible, fluid-containing tubing along its longitudinal axis, comprising:

a movable first conveying element having an essentially smooth endless circumferential surface without elevations;

a movable second conveying element having an endless circumferential surface and a number of equally-spaced elevations, wherein said conveying elements are arranged opposite one another for receiving therebetween a flexible, fluid-containing tubing passing parallel to the direction of movement of said conveying elements, and wherein said elevations of said second conveying element press toward the smooth surface of said first conveying element to compress said tubing at distances equal to the distances between said elevations;

means for movably driving said conveying elements; and

said elevations of said second conveying element comprise a plurality of circular, cylindrical rollers which are attached in a freely rotatable and non-driven manner to the circumference of said second conveying element and are aligned so that the axes of rotation of said rollers are transverse to the direction of movement of said second conveying element and are parallel to each other and wherein the circumference of each of said rollers is small relative to the circumference of said second conveying element.



4,527,506

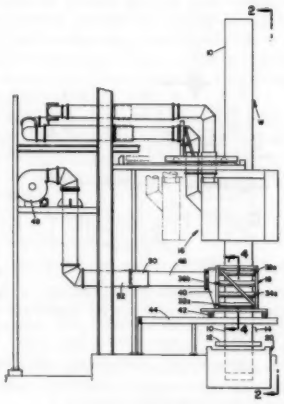
APPARATUS FOR COOLING A STRIP PRIOR TO A MINISPANGLE OPERATION

Max Hoetzl, Toledo, Ohio, assignor to Midland-Ross Coporation, Cleveland, Ohio

Filed Mar. 12, 1984, Ser. No. 588,646

Int. Cl.³ C23C *1/02*

U.S. Cl. 118—63 **9 Claims**



1. A minispangling apparatus comprising:

(a) steel strip conveying means adapted for conveying a continuous strip of hot steel along a work path;

(b) a galvanizing bath of molten zinc disposed in cooperative association with the strip conveying means for coating a steel strip;

(c) a coating weight control device in cooperative association with the strip conveying means downstream of said galvanizing bath to control the coating thickness on the strip;

(d) a natural cooling area disposed in cooperative association with the strip conveying means downstream along said

work path from the coating weight control device to cool the strip and coating with ambient conditions such that the coated strip emerges from the natural cooling area with a non-uniform temperature distribution in which the strip is cooler along opposite edges and warmer at a center area;

(e) a pre-cooler assembly disposed in cooperative association with the strip conveying means downstream of said work path from the natural cooling area, said pre-cooler assembly including (i) fluid nozzle means for discharging a band of fluid toward said work path generally transversely thereof and (ii) nozzle restricting means for selectively truncating the fluid band in a preselected pattern to restrict the discharge from the nozzle means non-uniformly across the work path width such that the amount of fluid discharged against a strip moving along the work path is selectively variable in accordance with the preselected restriction pattern across the strip width to effect strip cooling to a more uniform temperature distribution; and,

(f) a minispangle box disposed in cooperative association with the strip conveying means downstream along said work path from the pre-cooler assembly to produce a uniform minispangle appearance on the strip coating.

4,527,507

SPRAY APPARATUS FOR APPLYING A SHARP-EDGED PATTERN OF COATING

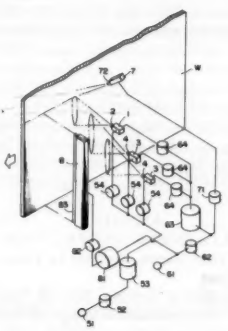
Katsumi Sawai; Koichi Komon; Isamu Matsuoka; Hidemi Tonobayashi; Masaaki Fujimura, all of Suzuka; Shiro Ito, Kawasaki, and Shuichi Seino, Hirakata, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,344

Claims priority, application Japan, Jul. 13, 1983, 58-127197

Int. Cl.³ B05B *7/06;* **B05C** *5/00*

U.S. Cl. 118—314 **7 Claims**



1. A spray apparatus for applying a sharp-edged layer of coating in overlap over surfaces pre-coated in a different color for producing a sharply divided two-tone pattern, comprising a first spray means designed to enable a spray of atomized paint discharged under pressure in an otherwise conical shape which is to be altered in spray formation by a jet of pressurized gas discharged in a conical shape having its axis placed in offset from the axis of said spray of atomized paint and at least one second spray means mounted to extend parallelly with said first spray means and designed to enable a spray of atomized paint discharged under pressure to be converged into a symmetrical spray formation by a jet of pressurized gas having its axis at the same point as said spray of atomized paint discharged by said second spray means, said first spray means being situated externally of said second spray means at a point where the film of coating produced on a surface having an area pre-coated in a different color bordering on the area to be coated from said spray of atomized paint that is discharged by said first spray means, has its outer edge bordering on said pre-coated area, the distance between said first and second spray means being such that said film produced on said surface by said first spray means overlaps, along its inner edge opposite to said outer edge, with a portion of the opposing edge of the film of coating produced from said spray of atomized paint by said second spray means.

4,527,508

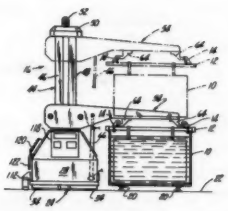
HOIST-TYPE MATERIAL FINISHING LINE

Robert J. Juve, Sterling Heights, Mich., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed May 11, 1983, Ser. No. 493,671

Int. Cl.³ B05C *3/10;* **B65G** *49/04*

U.S. Cl. 118—425 **20 Claims**



1. A material finishing line comprising a plurality of tanks disposed in a linear array and adapted to contain material finishing solutions, carrier means for suspending material in said tanks, elongated tracks means disposed in a fixed position laterally spaced from and extening parallel to said linear array, and a self-propelled hoist comprising a base including drive means for propelling said base lengthwise of said track means, guide means fixedly projecting vertically from said base only in an upward direction, a sole pick-up arm carried by said guide means for vertical motion with respect to said base and cantilevered from said guide means over said array so as to pass over said plurality of tanks as said base is propelled along said track means, means coupling said arm to said base for bodily moving said arm between raised and lowered positions with respect to said guide means and said base, and means rigidly suspended from said arm over said array and adapted to cooperate with said carrier means for selectively lifting carrier means and materials suspended from said carrier means and transporting said carrier means and materials suspended from said carrier means longitudinally above said tanks.

13. A free standing hoist apparatus for lifting, transporting and depositing work loads among a plurality of material finishing locations disposed in a linear array along a base floor, with each said work load including carrier means, said hoist apparatus comprising elongated track means adapted to be fixedly positioned on said base floor parallel to and laterally spaced from said array to guide the remainder of said hoist apparatus and said work ldads and a self-propelled hoist mechanism supported and guided by said track means and the floor including a base with drive means for propelling said base only horizontally along said base floor and means cooperating with said track means for confining propulsion of said base to a path lengthwise of said track means, guide means fixedly projecting vertically upwardly from said base, a pick-up arm carried by said guide means for vertical motion with respect to said base and cantilevered from said guide means over said array so as to pass successively over said plurality of locations as said base is propelled along said path, said pick-up arm only capable of rectilinear movement, pick-up means rigidly suspended from an end of said arm remote from said guide means and above said array for selectively engaging said carrier means, and means coupling said arm to said base for moving said arm only vertically along said guide means between a lowered position in which said pick-up means only capable of rectilinear movement is disposed to pass beneath said carrier means as said hoist

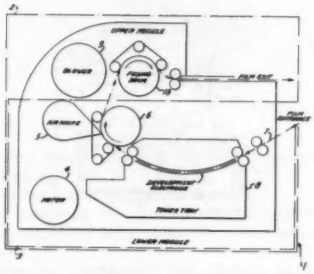
mechanism is propelled along said path and a raised position in which said arm and said pick-up means are adapted to support said carrier means and said work load for transportation above said locations.

4,527,509

DIELECTRIC FILM PROCESSOR

John J. Richardson, Wayne, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed May 10, 1984, Ser. No. 608,676
Int. Cl.[3] G03G *15/06*
U.S. Cl. 418—650 **2 Claims**



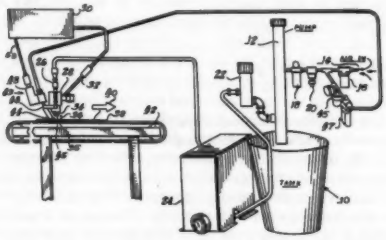
1. An improved dielectric film processor comprising a film entrance and exit means, film guide means located between said entrance and exit means, located between the the entrance and exit means and part of the film guide means is a toner supply and developing means, said toner supply and developing means has adjacent to both it and the exit means an air knife, backing roll means and fusing means for fusing an inage onto a film before it exits the processor wherein the improvement in said film processor is the toner supply and developing means has a concave manifold having toner fed slots from a top portion of the concave manifold to a bottom portion of the concave manifold with a toner exit hole located at the lower most portion of the concave manifold.

4,527,510

APPARATUS FOR APPLYING A COATING TO A MOVING SURFACE

Raymond J. Arndt, Chicago, Ill., assignor to Mactron, Inc., Worth, Ill.

Filed May 13, 1983, Ser. No. 494,516
Int. Cl.[3] B05B *12/04;* **B05C** *5/00*
U.S. Cl. 118—669 **8 Claims**



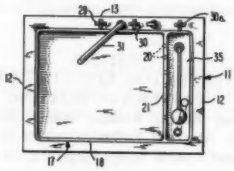
1. An improvement in a coating system including coating dispensing means having at least one coating outlet for delivering coating material to a surface of a moving workpiece to which coating is to be applied in a desired pattern, dispensing control means operatively coupled with said dispensing means and responsive to the position of said workpiece surface relative to a given fixed reference point for producing control signals for initiating and terminating the release of coating material to said outlet as predetermined portions of said workpiece surface come into alignment with said coating outlet, the improvement comprising: timing means responsive to said dispensing control means for producing a control signal for terminating said release of coating material a selectable time interval after initiation thereof in response to said dispensing control means; and means for selecting the control signal from one of said dispensing control means and said timing means for controlling each termination of said release of coating material.

4,527,511

PET BATH AND LITTER BOX COMBINATION

Henry B. Richards, Box 1395, Star Rte., Lillian, Ala. 36549

Filed Feb. 1, 1984, Ser. No. 575,907
Int. Cl.[3] A01K *1/035, 13/00*
U.S. Cl. 119—1 **1 Claim**



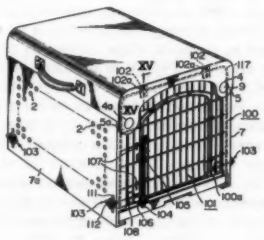
1. A pet bathing and litter box combination, comprising, in combination, a cabinet, a sink secured in said cabinet, a litter box secured in said cabinet, and plumbing received in said cabinet; said sink being fixedly secured in the upper portion of said cabinet, and said litter box being secured in the lower portion of said cabinet; and said sink including a sump at one end, and a divider wall being fixedly secured between the side walls and the bottom wall of said sink in a suitable manner, and said divider wall including a plurality of spaced openings through its bottom, adjacent to the top surface of said bottom wall of said sink, such that water, when turned on in said sink, passes through the spaced openings, into said sump, where it remains until a ball chain valve is lifted.

4,527,512

COLLAPSIBLE ANIMAL CAGE

Masami Sugiura, Funi, Japan, assignor to Tokyo Petcage Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 381,935, May 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 285,282, Jul. 20, 1981, , which is a continuation of Ser. No. 94,445, Nov. 15, 1979, abandoned. This application Nov. 2, 1983, Ser. No. 547,970
Int. Cl.[3] A01K *1/00*
U.S. Cl. 119—19 **1 Claim**



1. A collapsible animal cage comprising:

a cover frame having two pairs of pivot projections, each pair of which extends downwards at different distances from both sides of each end, the two lower pivot projections being positioned in one side of the cover frame and the two higher pivot projections in the other side;

a pair of side plates, one of which is higher than the other, each having a bottom groove in its lower end, each groove having an upper and lower step and the upper parts of the higher and lower side plates being pivotally mounted to the lower and the higher pivot projections of the cover frame, and said side plates being adapted to contact and lie flush with said cover frame when pivoted to a vertical, open position during assembly;

two pairs of assembly means each comprising of a circular cam means provided at the lower portion of the side plate, a long hole which is bored, penetrating the surface of the side plate, in the center of said circular cam means and extending straightly so as to have larger size than that of the diameter of said circular cam means and a stopping rod means; said cam means being divided into two peripheral said walls by side long hole and serving as a cam; said stopping rod means composing of a rigid rod held pivotally and movably on by a guide member to said metallic frame having a knob at one end, a stopper at the other end, and between said stopper and the guide member a coil spending into which said rigid rod is inserted being provided to energize said rigid rod outwardly;

a front end lattice and a rear end lattice whose upper parts are respectively fixed to the end portions of the front and the rear and whose lower parts are fixed to the side plates and are detachable therefrom; and

a bottom plate having a downwardly turned flange secured to each of two opposite edges and which is slidably inserted in the bottom grooves of the side plates with said flanges between said stop pieces and the interior surface of the side plates so that said side plates are substantially blocked from pivoting beyond said vertical position when folded open and said bottom plate is inserted.

4,527,513

POULTRY WATERER

Felix Hart, Leesburg, and Devon Eby, Nappanee, both of Ind., assignors to CTB, Inc., Milford, Ind.

Continuation-in-part of Ser. No. 553,844, Nov. 21, 1983, abandoned. This application Apr. 16, 1984, Ser. No. 601,038

Int. Cl.³ A01K *39/04*

U.S. Cl. 119—51.5 **16 Claims**

1. A combined feeding and watering system for poultry or like animals which are free to roam about a ground area, the system comprising, in combination, an elongated feed conveyor, a plurality of discrete spaced feeder pan units disposed in a row along and connected to the feed conveyor and disposed to present feed to the poultry, an elongated water line extending along and adjacent the feed conveyor, and a plurality of spaced water dispensing units connected to said water line and disposed in said row and interposed between the feeder pan units to present water to the poultry, means for raising and lowering said feeder pan units and said water dispensing units in unison, wherein a feeder pan unit includes a pan having interior and exterior portions, and a drop tube, the feeder pan unit including feed flow director means for presenting feed at an exterior pan portion to small poultry when the feeder pan unit is in a lowered configuration, the water dispensing units also being at lowered positions to provide water to the small poultry, the feeder pan unit feed flow director means operating to present feed at an interior pan portion to large poultry when the feeder pan unit is in a raised configuration, the water dispensing units also being at raised positions to provide water to the large poultry.

4,527,514

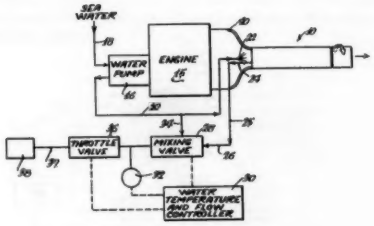
DIRECT CONTACT LIQUID HEATER AND HEATING METHOD

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 20, 1983, Ser. No. 543,991

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—31 R **4 Claims**



1. A direct contact water heater for heating water by the hot exhaust gases from a torpedo propulsion engine comprising, an elongate exhaust housing having an inlet connectable to the exhaust gas discharge of the torpedo propulsion engine and an outlet for ocean discharge, a mixing chamber intermediate the ends of the exhaust housing having a tubular wall, means for imparting a swirl velocity to exhaust gases entering said exhaust housing whereby swirling exhaust gases enter said mixing chamber, means for injecting water into said swirling exhaust gases immediately ahead of said mixing chamber to form water droplets which are centrifuged toward said wall of the mixing chamber to form a liquid annulus which moves along the length of the mixing chamber with the bulk of the swirling exhaust gases flowing centrally of the mixing chamber and inside the liquid annulus toward the exhaust housing outlet, and means at the end of the mixing chamber for collecting water from the liquid annulus and discharging the water from the water heater comprising a tubular pump housing rotatably mounted at an end of the exhaust housing and having a wall forming a continuation of the mixing chamber wall to receive the liquid annulus, means carried by the pump housing for rotating the pump housing in response to the flow of exhaust gases, and a pitot pump probe having an inlet position adjacent the pump housing wall to receive water from the liquid annulus.

4,527,515

STEAM GENERATOR CLEANING APPARATUS CONTROL SYSTEM

Lawrence R. Hester, II, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 483,807, Apr. 11, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 704,881

Int. Cl.³ F22B *37/52*

U.S. Cl. 122—392 **9 Claims**

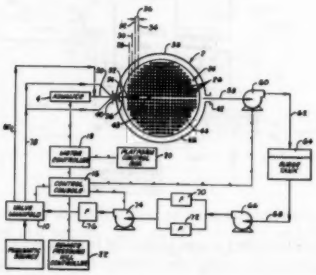
1. A system for controlling an apparatus for cleaning a steam generator, having an outlet, of material which has become deposited among a group of tubes contained within said steam generator above a tube sheet thereof, which apparatus includes an advance mechanism for moving a jetting outlet within said steam generator, a flushing outlet, and fluid source means for

providing a fluid under pressure to either said jetting outlet or said flushing outlet, said system comprising:

valve manifold means for communicating at different times siad fluid from said fluid source means with a selectable one of said jetting outlet or said flushing outlet for alternately creating, only at non-coincident times, a jetting fluid flow out of said jetting outlet directed among said tubes to separate the deposited material from among said tubes and a flushing fluid flow out of said flushing outlet directed along said tube sheet around said group of tubes to flush the separated material out said outlet of said steam generator;

advance mechanism control means for controlling the distance said advance mechanism moves said jetting outlet; and

control means for controlling said valve manifold means and said advance mechanism control means, said control



means including timing means for providing a first signal to said valve manifold means to cause said valve manifold means to communicate said fluid with said jetting outlet when said jetting outlet is stationary so that at least a portion of the material is separated from among said tubes at a first time and for providing, after the termination of said first signal, a second signal to said valve manifold means and said advance mechanism control means to cause said valve manifold means to communicate said fluid with said flushing outlet and to activate said advance mechanism control means to move said advance mechanism so that the portion of the material separated during said first time is washed toward said outlet of said steam generator at a second time which is different from said first time and so that said jetting outlet is incrementally moved only when no fluid is flowing through said jetting outlet.

4,527,516

DUAL FUEL ENGINE

Joseph S. Foster, West Vancouver, Canada, assignor to Pro-Staff Overload Enterprises Limited, Canada

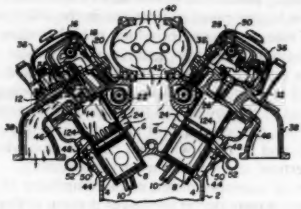
Filed Feb. 6, 1984, Ser. No. 576,937

Int. Cl.[3] F02B *49/00*

U.S. Cl. 123—27 GE **11 Claims**

1. In a uniflow dual fuel engine including a plurality of cylinders, a piston in each cylinder, inlet ports arranged around each cylinder to be uncovered by downward movement of the piston in the cylinder, means to force air into the cylinder through the inlet ports and a fuel injector to pump diesel fuel into the cylinder the improvement comprising an inlet pipe extending into one end of one inlet port of each cylinder to end immediately adjacent the interior of the cylinder and adapted to be connected at its distal end to a gas source;

a seal located in said one inlet port and contacting the inlet pipe to maintain the inlet pipe in a defined position in which the inlet pipe's upper edge is spaced below the upper edge of the inlet port whereby downward movement of the piston allows air through the inlet ports before said one inlet port is uncovered and upward movement of the piston closes the



said one inlet port before all other inlet ports are completely closed.

4,527,517

WATER PUMP FOR RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

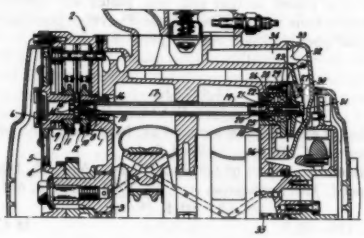
Hans Mezger, Freiberg; Reinhard Könneker, Monsheim, and Joachim Kelm, Pforzheim, all of Fed. Rep. of Germany, assignors to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Jul. 13, 1984, Ser. No. 630,775

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326318

Int. Cl.[3] F01P *5/12*

U.S. Cl. 123—41.47 **5 Claims**



1. A water pump apparatus of a reciprocating piston internal combustion engine, said engine including

a crank shaft housing having first and second end walls and a camshaft driven by a crankshaft mounted on said first end wall,

shaft means intermediate said crankshaft and said camshaft and drivingly connected to said crankshaft,

water pump means having a pump wheel mounted adjacent to but outwardly of said second end wall,

housing means surrounding said water pump means, said housing means forming one portion of the containment of said water pump means, said second end wall forming the remaining portion of said containment,

further shaft means coupling said intermediate shaft means and said water pump means,

said further shaft means being a hollow shaft, a first end of which is coupled to said intermediate shaft and the second end of which is mounted through said end wall and is connected to said pump wheel of said water pump means, and,

stud means inserted in said second end of said hollow shaft means, said stud means passing through said second wall, said pump wheel being centered and secured to the end of said stud means outwardly of said second wall.

4,527,518

INTERNAL COMBUSTION ENGINE HAVING SINGLE OVERHEAD CAMSHAFT

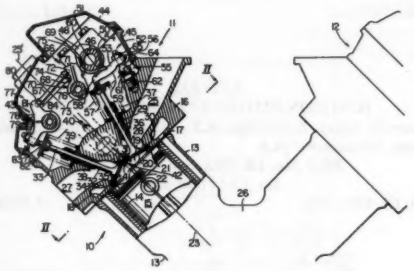
Kiyoshi Osaki, and Yutaka Koinuma, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,928

Claims priority, application Japan, Jul. 5, 1983, 58-122199; Jul. 5, 1983, 58-122200; Aug. 5, 1983, 58-143428

Int. Cl.³ F01L *1/26*

U.S. Cl. 123—90.23 **20 Claims**



1. An internal combustion engine including an engine block having a cylinder, a piston reciprocally mounted in the cylinder and a cylinder head having a combustion chamber, comprising,

a spark plug positioned in the cylinder head at about the axis of the cylinder,

an intake valve and an exhaust valve positioned in the cylinder head with the valve stems extending upwardly from the cylinder and spaced on opposite sides of said spark plug,

a single camshaft including a cam for opening said intake valve and a cam for opening said exhaust valve,

a push rod means,

a first cam follower means positioned between a cam and the stem end of one of said intake and exhaust valves

a second cam follower means positioned between a cam and a first end of said push rod means, and

a rocker arm means positioned between a second end of said push rod and the stem end of the other one of said intake and exhaust valve.

4,527,519

METHOD AND SYSTEM FOR CONTROLLING INTAKE FLOW BETWEEN DIRECT AND HELICAL INTAKE PASSAGES OF INTAKE PORT OF INTERNAL COMBUSTION ENGINE

Hidemi Oonaka, and Nobuki Uchitani, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 14, 1983, Ser. No. 504,323

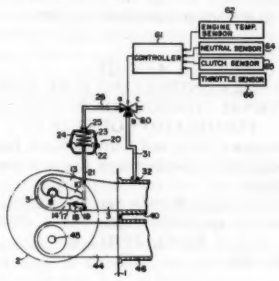
Claims priority, application Japan, Jun. 17, 1982, 57-105017; Jun. 17, 1982, 57-105018; Jun. 17, 1982, 57-105019

Int. Cl.³ F02F *1/42*

U.S. Cl. 123—188 M **24 Claims**

1. A method for controlling intake flow of an internal combustion engine having a cylinder head which defines a combustion chamber and has an intake port which opens to said combustion chamber through its end opening, said intake port including a helical passage which extends helically around and towards said end opening and a straight passage which extends substantially straight towards said end opening, and an intake passage switchover control valve system which can selectively alter the proportions of intake flow that pass through said straight passage and said helical passage, characterized in that said intake passage switchover control valve system is so controlled that a minimum proportion of intake flow is directed through said straight passage during idling operation of the engine regardless of the temperature condition of the engine, a maximum proportion of intake flow is directed through said straight passage during loaded operation at any non idling load of the engine when the engine is not warmed up, and a proportion of intake flow increasing according to the level of engine load is directed through said straight passage during loaded operation of the engine when the engine has been warmed up.

11. For an internal combustion engine having a cylinder head which defines a combustion chamber and has an intake port which opens to said combustion chamber through its one end opening and which is at its other end opening communicated to an interior space within an intake manifold, said intake port including a helical passage which extends helically around and towards its said one end opening and a straight passage which extends substantially straight towards its said one end opening, and an intake passage switchover control valve system which is controllable so as to selectively alter the proportions of intake flow that pass through said straight passage and said helical passage:



a system for controlling intake flow of the engine, comprising:

a means for detecting the temperature of the engine,

a means for detecting the load condition of the engine,

and an actuating system for said intake passage switchover control valve system which, according to the temperature of the engine as detected by said temperature detection means and according to the load on the engine as detected by said engine load detecting means, so actuates said intake passage switchover control valve system as to cause a minimum proportion of intake flow to be directed through said straight passage during idling operation of the engine regardless of the temperature condition of the engine, a maximum proportion of intake flow to be directed through said straight passage during loaded operation at any non idling load of the engine when the engine is not warmed up, and a proportion of intake flow increasing according to the level of engine load to be directed through said straight passage during loaded operation of the engine when the cooling water of the engine has been warmed up.

4,527,520

LUBRICATION OF AN ANCILLARY PUMP FITTED TO AN ENGINE

John W. Koch, Como, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

Filed Jan. 16, 1984, Ser. No. 570,834

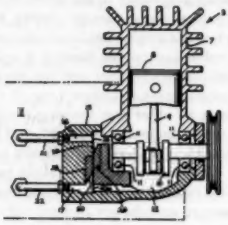
Claims priority, application Australia, Jan. 19, 1983, PF7675

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 R **9 Claims**

1. In combination with an internal combustion engine having a compartment in which an air/oil mist mixture exists during normal operation of the engine, a pump having a crankshaft journalled in a crankcase, a cylinder, a piston coupled to said

crankshaft to reciprocate in the cylinder, means connecting the pump crankshaft to the engine for driving the pump by the engine, an intake and a return passage each communicating the pump crankcase with said engine compartment, respective



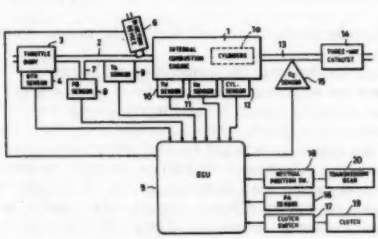
valves in said passages arranged so that reciprocation of the pump piston will circulate the air/oil mist mixture from the engine compartment through the pump crankcase to provide lubrication to the pump crankshaft and piston.

4,527,521

METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AFTER TERMINATION OF FUEL CUT

Shumpei Hasegawa, Niiza, and Noriyuki Kishi, Itabashi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,082
Claims priority, application Japan, Jun. 9, 1982, 57-98946
Int. Cl.[3] F02D *5/00*
U.S. Cl. 123—326 **13 Claims**



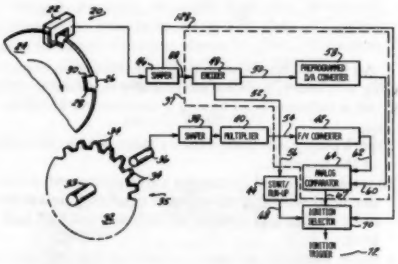
1. A method for controlling the quantity of fuel being supplied to an internal combustion engine for a vehicle having wheels, said engine having a power transmission means for transmitting engine torque to the wheels of said vehicle, to a required quantity, by increasing the fuel quantity by an increment which is set in synchronism with generation of pulses of a predetermined control signal generated at a predetermined crank angle of said engine, after termination of a fuel cut operation which is effected when said engine is operating in a predetermined operating condition while it is decelerating, the method comprising the steps of: (1) detecting a transition of the operative state of said engine from said predetermined operating condition wherein the fuel supply to said engine is to be cut off to another operating condition wherein the fuel supply is to be effected; (2) determining whether or not said power transmission means is in an engaged state; and (3) effecting said increase of the fuel quantity for a period of time after said transition has been detected and before a predetermined number of pulses of said control signal are generated, in a manner which comprises: (a) effecting said increase of the fuel quantity so long as said power transmission means remains in a disengaged state; and (b) prohibiting said increase of the fuel quantity so long as said power transmission means remains in said engaged state.

4,527,522

IGNITION TIMING CONTROL SYSTEM

Robert S. Cerny, Bainbridge, N.Y., assignor to Allied Corporation, Morristown, N.J.

Filed Jan. 13, 1983, Ser. No. 457,555
Int. Cl.[3] F02P *5/04*
U.S. Cl. 123—416 **14 Claims**



1. In an ignition timing control system for an internal combustion engine including the combination of a plurality of combustion cylinders, a crankshaft and a spark plug associated with each of the cylinders for initiating combustion of fuel, the improvement comprising:

first means for generating a plurality of reference pulses, each of said reference pulses being associated with the ignition timing in one of said cylinders, the timing duration of said pulses being substantially constant, the leading edge of each of said reference pulses corresponding to the maximum ignition timing advance for the associated cylinder;

second means for generating selectively variable timing signals using said references pulses;

means for producing ignition trigger signals resulting in firing of the spark plugs, including means for outputting said trigger signals in response to said reference pulses when the speed of said engine is less than a preselected value and for outputting said trigger signals in response to said selectively variable timing signals when the speed of said engine is at least as great as said preselected value;

means for detecting incremental rotation of said crankshaft and for converting the detected incremental rotation of said crankshaft to an electrical signal having a frequency corresponding to the detected incremental rotation; and

means for multiplying the frequency of said electrical signal including a phase-locked loop and a programmable binary counter connected with said phase-locked loop and wherein said second generating means includes means for converting the multiplied frequency of said electrical signal to a timing control signal having a voltage proportional to said multiplied frequency.

4,527,523

SYSTEM FOR DAMPING BUCKING OSCILLATIONS OF AN AUTOMOBILE ENGINE

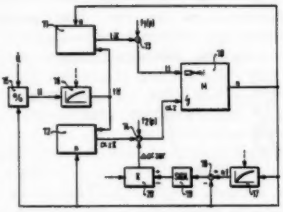
Rolf Däumer, Weil der Stadt; Ekkehard Feldmann, Hemmingen; Martin Person, Oberriexingen; Ernst Wild, Weissach-Flacht, and Martin Zechnall, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,531

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243235

Int. Cl.³ F02P *5/06*

U.S. Cl. 123—419 **15 Claims**



1. Apparatus for damping low-frequency bucking oscillations in the operation of a motor vehicle having an electrical ignition system, including means for producing a signal corresponding to an operating parameter of said engine indicative of said oscillations and means for control of at least one control magnitude of said engine in a manner counteracting said oscillations, said apparatus further comprising, in a system in which said control magnitude is the ignition angle (α) determining ignition timing:

means for deriving from said signal an alternating derived electrical signal having a phase relation to said oscillations suitable for indicating the appropriate direction for counteraction of said oscillations during cycles of the latter, and

means responsive to said derived signal for applying, with a sign alternating with the alternations of said derived signal, an ignition angle correction value ($\Delta\alpha zar$) for said ignition angle, and thereby advancing ignition timing when said ignition cycle correction value is applied with a positive sign and retarding ignition timing when said ignition angle correction value is applied with a negative sign.

4,527,524

METHOD AND DEVICE TO VARY THE IGNITION TIMING ANGLE TO AVOID PINGING IN AN INTERNAL COMBUSTION ENGINE

Serge Guipaud, Castelnaudary, France, assignor to Equipments Automobiles Marchal, Issy-les-Moulineaux, France

Filed Aug. 10, 1982, Ser. No. 406,979

Claims priority, application France, Aug. 11, 1981, 81 15543

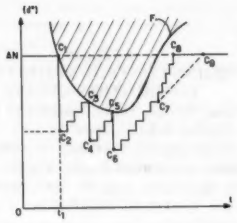
Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **14 Claims**

1. In a method for modifying the ignition timing angle in relation to the top dead centre to avoid pinging in an internal combustion engine, wherein whenever pinging is detected the ignition advance angle is reduced by a given angular retardation to no less than a predetermined minimum advance angle, to arrive at a corrected advance angle corresponding to an absence of pinging and wherein, in the absence of pinging at said corrected advance angle, the angle of advance is progressively increased from said corrected value to the value corresponding to the normal ignition advance angle value AN, the improvement wherein:

(a) starting from said corrected advance angle value, the advance angle is increased stepwise in the course of time at a first incremental rate of increase which is being maintained so long as the absence of pinging is maintained, up to a maximum cumulative increase; and

(b) if, starting with said corrected advance angle value, the maximum cumulative increase is attained without again detecting pinging the advance angle is increased stepwise



in the course of time at a second incremental rate until said normal advance angle value or the detection of recurrence of pinging, wherein said said second incremental rate of increase is no less than said first incremental rate prevailing at the time of transition from said first to said second incremental rate.

4,527,525

CONTROL METHOD AND APPARATUS FOR COMBATING KNOCKING IN INTERNAL COMBUSTION ENGINES

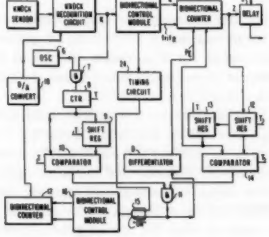
Walter Mauermann, Stuttgart, and Ingo Dudeck, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,649

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142082

Int. Cl.³ F02P *5/14;* **F02D** *37/02*

U.S. Cl. 123—425 **16 Claims**



1. A control method for combating knocking in internal combustion engines, the control method comprising the steps of

comparing pre-processed sensor-signals with a threshold value (S) to produce knock-signals (K),

producing a control input signal (Z) in response to the knock-signals (K) for controlling an engine, which

while knock-signals (K) are occurring, is increased, at a defined rise-rate, up to a maximum value, and which,

if no knock-signals occur, is reduced, at a defined decay-rate, down to a minimum value,

increasing the threshold value (S) following the occurrence of knock-signals, at a defined rise-rate, up to a maximum value,

(a) either for as long as the knock-signals do not diminish, in spite of the control input signal (Z) having previously

been increased, whereupon, if this happens, increase of the control input signal (Z) is discontinued, and

(b) if a defined period has elapsed, since the last reduction of the control input signal (Z), without another reduction having taken place, whereupon, if knock-signals (K) are not occurring, the threshold value (S) is reduced to one of a minimum value at a defined decay-rate, and constant value.

4,527,526

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

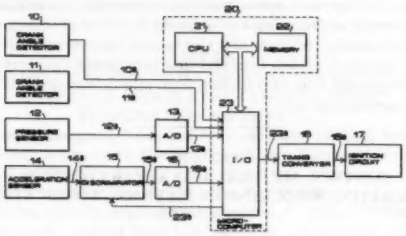
Masahira Akasu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1984, Ser. No. 641,506

Claims priority, application Japan, Aug. 17, 1983, 58-151285; Aug. 17, 1983, 58-151286; Aug. 17, 1983, 58-151287

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **13 Claims**



1. An ignition timing control system for an internal combustion engine with a plurality of cylinders comprising:

means for detecting the occurrence of knocking of said engine;

sensor means for detecting the operating condition of said engine;

means for generating a reference control value in correspondence to an engine operating condition detected by said sensor;

means for identifying one of said cylinders to be ignited next;

means for increasing or decreasing an ignition timing modification value for a cylinder identified by said cylinder identification means in accordance with the output of said knock detection means;

means for determining the ignition timing for a cylinder to be ignited next in accordance with a control value obtained through a certain computation based on said reference control value and said modified ignition timing modification value, said means for varying the ignition timing modification value being capable of varying said modification value so that the ignition timing modification value can take either positive or negative polarity.

4,527,527

APPARATUS FOR CONTROLLING OPENING ANGLE OF THROTTLE VALVE ON COMPLETE FIRING

Hiroshi Irino, and Tomio Aoi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,889

Claims priority, application Japan, Jan. 27, 1983, 58-10518

Int. Cl.³ F02M *1/10*

U.S. Cl. 123—438 **3 Claims**

1. An apparatus for controlling the opening angle of a throttle valve on complete firing comprising:

a throttle valve disposed in an intake barrel of a carburetor,

a choke valve disposed upstream of said throttle valve,

a motor for driving said throttle valve and said choke valve to control the respective opening angles of both the valves,

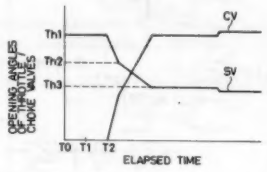
means for detecting a temperature and a rotational speed of an engine,

means for sensing when said engine has reached a state of complete firing,

a starting position memory for storing the opening angle of said throttle valve at the time when said engine starts by utilizing temperature of said engine as a parameter,

a memory for primary position of said throttle valve on the complete firing for storing said primary position as an intermediate position which lies between a starting position and a warming-up position after said engine has reached the complete firing state by utilizing the temperature of said engine as a parameter,

a memory for secondary position of said throttle valve on the complete firing for storing said secondary position as a



warming-up position after said engine has reached the complete firing state by utilizing the temperature of said engine as a parameter,

at least one pulse rate setting memory for determining the speed at which said throttle valve shifts to each target opening angle, and

means for comparing each target opening angle of said throttle valve with the existing opening angle thereof to drive said motor in response to the resulting deviation,

the speed at which said throttle valve is shifted from said starting position to said intermediate primary position of the throttle valve on the complete firing being greater than the speed at which said throttle valve is shifted from said intermediate primary position to said warming-up secondary position on the complete firing.

4,527,528

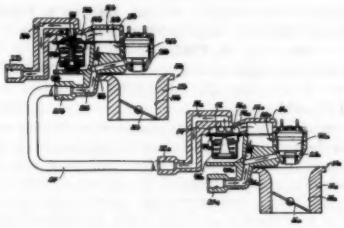
FUEL INJECTION SYSTEM

Charles E. Finn, Rochester, N.Y.; Allan M. Ruckey, Pontiac, Mich., and David C. Shuler, Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1981, Ser. No. 320,502

Int. Cl.³ F02M *41/02*

U.S. Cl. 123—447 **1 Claim**



1. A system for delivering fuel into an engine induction region, said system comprising means defining a fuel flow path including in series a fuel inlet followed by a first fuel injector chamber followed by a remotely spaced second fuel injector

chamber followed by a pressure regulator chamber followed by a fuel outlet, said fuel flow path being adapted to circulate fuel from said inlet through said chambers to said outlet, said means further defining an accumulator chamber connected to said first injector chamber, said apparatus also comprising fuel injectors adapted to deliver fuel in timed pulses from said injector chambers into said induction region, and an accumulator diaphragm defining a portion of said accumulator chamber, said accumulator diaphragm being effective to reduce the volume of said accumulator chamber to thereby minimize a reduction in the pressure in said accumulator chamber and said first injector chamber, said fuel flow path also including a valve seat formed about the portion of the fuel flow path opening from said pressure regulator chamber to said outlet, and said system further comprising a valve member controlling fuel flow through said valve seat, and a pressure regulator diaphragm carrying said valve member and defining a portion of said pressure regulator chamber, said pressure regulator diaphragm being effective to position said valve member to control fuel flow through said valve seat in a manner which will maintain a substantially constant pressure in said fuel flow path upstream of said valve seat, said pressure regulator diaphragm being further effective to reduce the volume of said pressure regulator chamber to thereby minimize a reduction in the pressure in said pressure regulator chamber and said second injector chamber, said system thereby effecting a substantially constant pressure in said injector chambers and minimizing the momentary reduction in pressure in said injector chambers which would otherwise occur as said injectors deliver fuel into said induction region, and wherein the injector associated with said second injector chamber has a greater flow capacity than the injector associated with said first injector chamber to compensate for a pressure gradient along said flow path from said accumulator chamber to said second injector chamber and thereby provide equal fuel delivery by said injectors.

4,527,529

METHOD AND APPARATUS FOR CONTROLLING FUEL INJECTION FOR AN INTERNAL COMBUSTION ENGINE

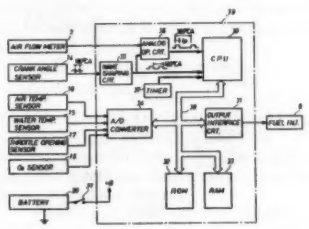
Makoto Suzuki, Mishima; Toshiyuki Takimoto, Susono; Mamoru Yoshioka, Susono, and Takatoshi Masui, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 9, 1983, Ser. No. 550,207

Claims priority, application Japan, Nov. 16, 1982, 57-200801; Nov. 24, 1982, 57-206664

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—478 **5 Claims**



1. An apparatus for electronic fuel injection for an internal combustion engine which comprises the following means;

first means which outputs a synchronous fuel injection controlling signal to the injector at a predetermined time period synchronized with the rotation of a crank shaft of the engine in accordance with operating conditions of the engine;

second means comprising as follows:

memory means for reading the throttle opening TA detected by a throttle valve sensor to store into a predetermined memory area in a RAM;

calculating means for calculating ΔTA which is obtainable by subtracting the throttle opening TA OLD detected this time from the previous throttle valve opening TA stored in RAM;

limiting means for regulating the upper and lower limitations to determine $\Delta TA=0$ in the case the value of ΔTA is minus, and to determine $\Delta TA=\theta$ in the case the value of TA is larger than θ;

comparing means for comparing whether the variable ΔTA is greater than a predetermined value;

retrieving means for retrieving the constant K from the constant K data map which is stored in a ROM and given by the function $K=f(\Delta TA)$ in accordance with ΔTA in the case that said variable ΔTA of the throttle valve is larger than said predetermined value;

third means which compares an up-to-date fuel injection amount TP injected from the first means before detecting the variable of said throttle valve openings ΔTA with an allowable maximum injection amount TPmax detected at said detected points; and

fourth means which outputs an asynchronous fuel injection controlling signal performed asynchronously with the number of the rotation of the crank shaft as well as said asynchronous fuel injection controlling signal in accordance with a result ACCPLS obtained by multiplying said constant K by a difference ΔTP; ΔTP is a difference between said allowable maximum injection amount TPmax and said up-to-date fuel injection amount TP to the injector when said variable of throttle valve openings ΔTA is larger than a predetermined value and when said up-to-date fuel injection amount TP is smaller than said allowable injection amount TPmax.

4,527,530

METHOD FOR CORRECTING A CONTROLLED VARIABLE FOR THE CONTROL OF THE OPERATION OF AN INTERNAL COMBUSTION ENGINE ON THE BASIS OF THE QUANTITY OF SUCTION AIR

Tomoaki Abe, Oobu; Masumi Kinugawa, Okazaki, and Shunichiro Hiromasa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 5, 1983, Ser. No. 558,191

Claims priority, application Japan, Dec. 7, 1982, 57-215297

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—494 **7 Claims**

1. A method for correcting a controlled variable for the control of the air-fuel ratio of an internal combustion engine comprising:

arranging a thermal type flowmeter in a suction air passage of the engine;

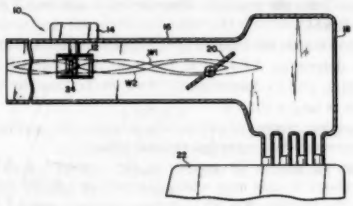
preparing and storing correction data indicating how an output from the thermal type flowmeter is influenced by pulsation of the air flowing through the suction air passage as a function of engine speed;

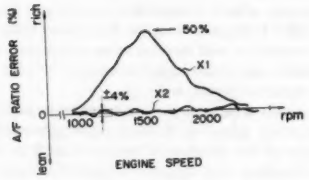
periodically measuring a quantity of suction air of the engine using the thermal type flow meter;

calculating a differential suction air quantity based on a change in quantity of suction air from one measurement to

another, said differential representing a magnitude of pulsation of the suction air;

determining current engine speed; and





calculating a correction factor for correcting said controlled variable on the basis of said differential and of said correction data corresponding to current engine speed.

4,527,531

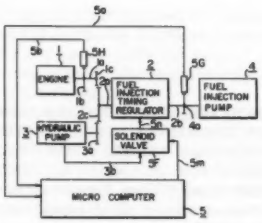
METHOD OF DETECTING FUEL INJECTION TIMING

Yuzo Koyanagi, Warabi; Tetuo Koike, Hachioji; Takayuki Suzuki, Tokorozawa, and Tadakazu Shiozaki, Hachioji, all of Japan, assignors to Sanwa Seiki Mfg., Co. Ltd., Yono, Japan

Filed Feb. 8, 1982, Ser. No. 346,644

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—501 **8 Claims**



1. A method of detecting the timing of fuel injection in an engine comprising the steps of:

mounting a first rotary member in a drive system of an output shaft of a fuel injection timing regulator,

providing at least one first rotation angle indicating means on the circumference of said first rotary member in the direction of rotation of the same to indicate the timing of fuel injection by a fuel injection pump,

mounting a second rotary member in a drive system of an input shaft of said fuel injection timing regulator, said input shaft being linked with the crankshaft of the engine, and said fuel injection timing regulator varying a phase angle between said input and output shafts in accordance with engine parameters,

providing at least one second rotation angle indicating means on the circumference of said second rotary member in the direction of rotation of the same to indicate the phase angle of said second rotary member relative to said first rotary member having said first rotation angle indicating means provided thereon,

providing at least one reference rotation angle indicating means on the circumference of said second rotary member at a position ahead of said second rotation angle indicating means in the direction of rotation of said second rotary member,

disposing first and second sensing means opposite to said first and second rotary members respectively for sensing said reference rotation angle indicating means, said first rotation angle indicating means and said second rotation angle indicating means passing the positions opposite thereto,

measuring the reference time difference between the pass time of said reference rotation angle indicating means and that of said second rotation angle indicating means passing the position opposite to said second sensing means,

measuring the time difference between the pass time of said first rotation angle indicating means and that of said second rotation angle indicating means passing the positions opposite to said first and second sensing means respectively, the pass time of said first rotation angle indicating means being adapted to occur between the pass time of said reference rotation angle indicating means and that of said second rotation angle indicating means, so that the order of occurrences of the pass times is always unchanged to identify each of said rotation angle indicating means on the basis of which said time differences are measured, and

calculating the phase angle of one of said shafts relative to the other on the basis of said measured former and latter time differences.

4,527,532

FUEL-VAPOR EMISSION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

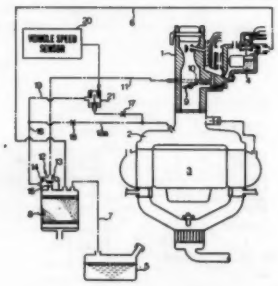
Yoshiaki Kasai, Kiyose; Yasuo Hiraoka, Hachioji; Masaharu Yuasa, Fujisawa; Masataka Harada, and Masao Saito, both of Oota, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,273

Claims priority, application Japan, May 19, 1983, 58-88071

Int. Cl.³ F02M *33/02*

U.S. Cl. 123—520 **11 Claims**



1. A fuel-vapor emission control system for an automotive engine mounted on a vehicle, the engine having an intake manifold communicating with a carburetor having a float chamber, and a fuel tank, comprising:

a canister having a vacuum-operated purge control valve, and said canister being communicated with said float chamber and said fuel tank for purging fuel-vapor;

a passage communicating a port in said carburetor with a vacuum chamber of said vacuum-operated purge control

valve so as to apply manifold vacuum to said vacuum chamber at partial-throttle operation;

purge passage means for communicating said canister with said intake manifold;

said purge passage means comprises parallel purge lines meeting upstream and downstream with a common line being fed to said intake manifold,

valve means provided in only one of said purge lines for controlling the purging of the fuel-vapor; and

means for opening said valve means under such conditions that the engine does not stall.

4,527,533

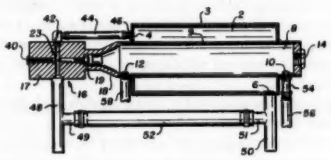
GASOLINE PREHEATER

Joseph M. Laramee, 508 Birch St., Okanagen Falls, British Columbia, Canada

Filed Dec. 2, 1983, Ser. No. 558,413

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **24 Claims**



1. A gasoline preheater, comprising

(a) a hot fluid chamber having an inlet and outlet;

(b) a gasoline chamber in heat exchanging contact with said hot fluid chamber, and having an inlet, an outlet, and an access port therein;

(c) a thermostat having:

(i) a housing with a valve member bore extending therethrough, and a hot fluid passage extending therethrough which intersects the valve member bore and communicates with said hot fluid chamber;

(ii) a valve member disposed within the valve member bore and slidable therein between a fully closed position blocking the hot fluid passage, and a fully open position not substantially blocking the hot fluid passage;

(iii) a heat sensing element releasably mounted on the housing so as to be removable therefrom through the access port in the gasoline chamber, and communicating with said gasoline chamber and said valve member so as to reversibly move the valve member toward the fully closed position and allow decreased hot fluid flow through the hot fluid bore and into the hot fluid chamber, in response to an increase in gasoline temperature in said gasoline chamber.

4,527,534

FUEL INTAKE CONTROL SYSTEM FOR SUPERCHARGED ENGINE

Shigeru Sakurai; Hiroyuki Oda; Haruhiko Satow, and Haruo Okimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 3, 1982, Ser. No. 414,861

Claims priority, application Japan, Sep. 7, 1981, 56-140535; Sep. 7, 1981, 56-140536

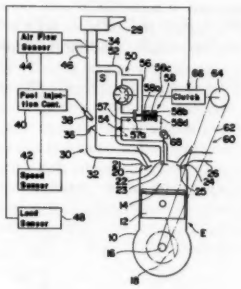
Int. Cl.³ F02B *33/36*

U.S. Cl. 123—559 **12 Claims**

1. A fuel intake control system for an internal combustion engine having a combustion chamber, said control system comprising, in combination:

primary intake means for supplying a combustible air-fuel mixture to the combustion chamber during all engine operating conditions;

auxiliary intake means including a supercharger for supplying at least a supercharged air to the combustion chamber separately of air flowing through the primary intake means, said auxiliary intake means being operable during a high load engine operating condition to supply the supercharged air to the combustion chamber at least during a period in which the engine undergoes a compression stroke, said auxiliary intake means including an auxiliary throttle valve disposed therein downstream of the supercharger with respect to the direction of flow of the supercharged air towards the combustion chamber, said auxiliary throttle valve being operable



to regulate the flow of the supercharged air to the combustion chamber in response to a load on the engine exeeding a predetermined value;

drive means driven by the engine for driving the supercharger to cause the supercharger to produce the supercharged air; and

control means for regulating the pressure of the supercharged air between the supercharger and the auxiliary throttle valve such that the pressure increases with an increased opening of the auxiliary throttle valve.

4,527,535

IGNITION SYSTEM INCLUDING IGNITION DISTRIBUTOR INTEGRATED WITH IGNITION COIL

Teruyoshi Ito, Kariya, and Shigeya Abe, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

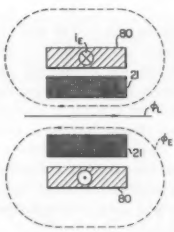
Division of Ser. No. 405,906, Aug. 6, 1982, Pat. No. 4,453,526. This application Apr. 17, 1984, Ser. No. 601,339

Claims priority, application Japan, Aug. 7, 1981, 56-123727

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.³ F02D *1/00*

U.S. Cl. 123—617 **3 Claims**



1. An ignition system for an internal combustion engine comprising:

a distributor proper;

a rotary shaft arranged inside of the distributor proper and rotated in synchronism with the rotation of the engine;

a signal rotor mounted on the rotary shaft;

a rotational signal generator arranged in opposed relation to said signal rotor in said distributor proper, said rotation signal generator including a magnetic flux generator and a magnetic flux change sensor having an axis extending in a radial direction of said signal rotor, for detecting change in the magnetic flux due to the rotation of said signal rotor and producing a signal in synchronism with the rotation of the engine signal generator further including an electric conductor; and

an ignition coil including a primary winding and a secondary winding, a current flow through said primary winding being controlled in accordance with the output signal of said rotation signal generator, a high voltage being induced in said secondary winding in accordance with the controlled current flow in said primary winding;

wherein said rotation signal generator further comprises an electrical conductor member arranged on the outer periphery of said magnetic flux change sensor and having a current conducting path around said axis of said sensor for producing an opposing magnetic flux when a leakage flux from said ignition coil crosses through said rotation signal generator, whereby a generation of a noise signal in said magnetic flux change sensor due to at least said leakage flux is suppressed.

4,527,536

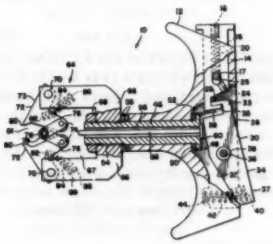
BOW STRING RELEASE DEVICE

Ted Smith, P.O. Box 706, Sophia, W. Va. 25921

Filed Nov. 16, 1982, Ser. No. 442,170

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—35 A **13 Claims**



1. A bow release comprising:

a handle;

a head frame means attached to said handle, for holding and releasing a bow string wherein said head frame means comprises means for permitting movement thereof between an open position for releasing a bow string and a closed position for holding a bow string therein;

a firing pin, said release further comprising means for permitting said firing pin to be movably attached to said handle, said release further comprising means for moving between said pin a first position disengaged from said head frame means and a second position engaging said head frame means; and

said moving means, attached to said handle, for moving said firing pin from said first position to said second position to move said head frame means from said closed to said open position, wherein said moving means is spaced from said moving pin before said firing means moves said firing pin from said first position to said second position.

4,527,537

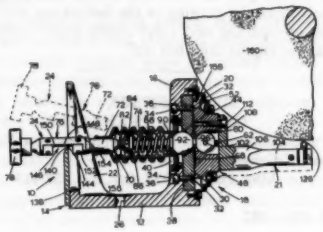
DRESSING TOOL FOR GRINDING WHEELS

Edward D. Garner, 4200 N. 48th St., Lincoln, Nebr. 68504

Filed Jan. 30, 1984, Ser. No. 575,075

Int. Cl.³ B24B *53/08*

U.S. Cl. 125—11 TP **19 Claims**



1. A dressing tool for grinding wheels, comprising:

a vertically disposed fixed plate having a front and rear side,

a template with a predetermined profile mounted in a predetermined spaced relationship from the rear side of said fixed plate,

a second plate disposed in juxtaposition with the front side of said fixed plate,

an elongated tracing rod having a first end and a second end,

means extending said first end through said fixed plate from the rear side free of engagement therewith and into said second plate,

means for operatively securing said first end to said second plate,

yielding means on said rod intermediate said fixed plate and said template and operatively engaging the rear side of said first plate,

means for adjusting said yielding means whereby said second plate is yieldingly held in juxtaposition with said fixed plate and capable of horizontal, lateral, rotary and diagonal movement relative thereto separately or in combination in response to movement of said rod,

a diamond point mount means operatively secured to said second plate and correspondingly movable therewith, and

said second end of said rod disposed and adapted for manual movement in contact with said profile whereby said first end acts against said second plate to move the same and correspondingly move said diamond point to reproduce the template profile.

4,527,538

SELF-CONTAINED OVEN

Dennis Caferro, N. 3223 Market, Spokane, Wash. 99207

Filed May 10, 1984, Ser. No. 608,945

Int. Cl.³ F24C *15/32*

U.S. Cl. 126—21 R **12 Claims**

1. A self-contained oven utilizing natural draft currents to transfer heat to an object within the oven, comprising:

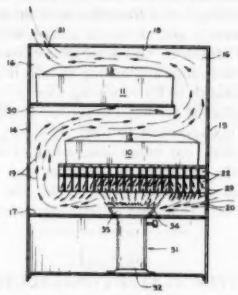
a hollow enclosure having an exteriorly vented inlet and an exteriorly vented outlet;

a transverse horizontal grill located within the interior of the enclosure;

radiant heat means positioned directly beneath the grill for directing radiant heat energy onto the grill from below;

said grill comprising a lower section presenting a plurality of downwardly open hollow cells formed between intersecting upright metal walls, the cells in said lower section being capped by a solid transverse metal plate, an upper section mounted to the metal plate and overlying said lower section, said upper section presenting a plurality of hollow cells formed between intersecting upright solid metal walls; and

said grill being positioned within the enclosure as the upper boundary of a gaseous path leading from the inlet to said



radiant heat means and from the radiant heat means to said outlet.

4,527,539

GAS HOTPLATE

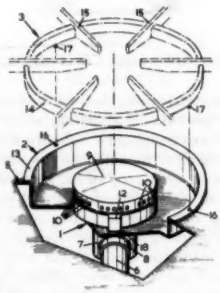
Arthur S. Kay, Burnley, England, assignor to Burco-Dean Limited, Lancashire, England

Filed Jul. 25, 1983, Ser. No. 516,403

Claims priority, application United Kingdom, Jul. 24, 1982, 8221485

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—39 R **5 Claims**



1. A gas hotplate for use in a gas cooker comprising a gas burner having a gas supply and a burner head comprising therein at least three spaced groups of apertures, at which apertures gas is burnt, such that between the groups of apertures gaps are provided around the burner head where the intensity of the flame is reduced and a pan support comprising at least three members, but not more members than there are groups of apertures, which members extend radially towards the centre of the burner head and which can be aligned with the gaps between the groups of apertures, wherein the gas hotplate comprises means whereby the pan support can be fixed in position relative to the burner head with its support members in alignment with the gaps between the groups of apertures therein; wherein the gas hotplate is mounted in an aperture in the surface of a cooker; wherein the surface is comprised of glass; wherein the gas hotplate comprises a spillage bowl which is removably located closely about and generally below the burner head and is supported in position about the burner head by means of a rim provided around the edge thereof which rests on the edge of the aperture in the cooker surface; wherein the spillage bowl is fixed in position relative to the burner head and comprises means whereby the pan support is secured thereto with its support members in alignment with the gaps between the groups of apertures in the burner head; and wherein the means by which the spillage bowl is fixed in position relative to the burner head comprises a key provided on the side of the burner head which engages in a slot in the spillage bowl to lock them in position relative to one another.

4,527,540

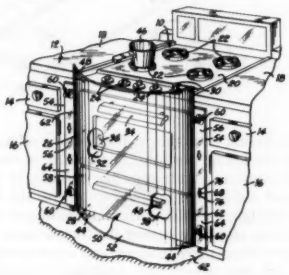
CHILDREN'S SAFETY SHIELD FOR APPLIANCES

Kathryn A. Ryan, and Gregory F. Ryan, both of 77 Erie St., Dumont, N.J. 07628

Filed Jun. 18, 1984, Ser. No. 621,960

Int. Cl.³ F24C *3/12*

U.S. Cl. 126—42 **12 Claims**



1. A safety shield for isolating a heated appliance, such as a stove or an oven, from the reach of children, the appliance having a front face with a height extending between a top and a base and a width extending between vertical sides, the safety shield comprising:

a sheet of flexible material extending horizontally between vertically-extending edges;

securing portions integral with the sheet at the vertically-extending edges thereof;

the sheet of flexible material including a shielding portion extending between the securing portions; and

securing means carried by the securing portions for firmly securing the securing portions with respect to the sides of the appliance such that the shielding portion is in fixed position spanning the appliance and extending outwardly from the front face of the appliance in an outwardly bowed reinforcing configuration to shield the appliance from the reach of children;

the shielding portion being provided with sufficient rigidity as a result of the firmly secured securing portions and the outwardly bowed reinforcing configuration to resist collapse of the flexible material inwardly toward the front face of the appliance in response to contact by said children.

4,527,541

ASSEMBLY FOR INSTALLATION IN CHIMNEY FLUES TO DIRECT STOVEPIPE EXHAUST

Charles D. Roberts, 812-A Barstow Ave., Clovis, Calif. 93612

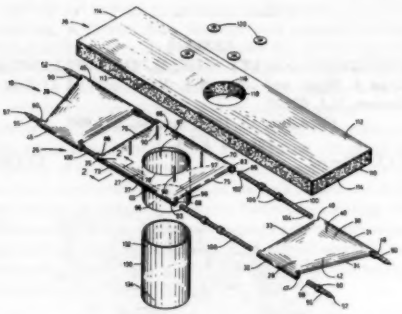
Filed Apr. 24, 1984, Ser. No. 603,444

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—123 **10 Claims**

1. An assembly for conducting the flow of exhaust from a fireplace insert stovepipe of predetermined dimensions through a chimney flue disposed upwardly thereof and having a predetermined forward surface, a rearward surface spaced from the forward surface, and lateral surfaces spaced from

each other and interconnecting the forward and rearward surfaces to define and bound a passage of predetermined dimensions and configuration, the assembly comprising a mounting assembly having a substantially planar portion adapted to be attached on the flue in an operative attitude, the planar portion having predetermined lateral portions individually adapted to be attached on a lateral surface of the flue to support the planar portion in a substantially horizontal attitude and a central portion intermediate the lateral portions laterally



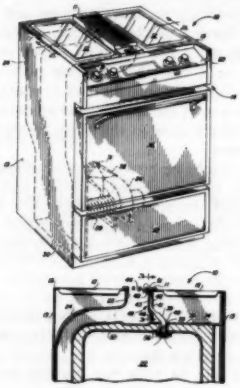
adjustable to permit deployment thereof in a selected attitude spaced from the lateral portions, said central portion having a substantially continuous interior edge defining an aperture of predetermined dimensions adapted to permit the flow of exhaust therethrough; a gasket portion dimensioned to be biased by the mounting assembly against the flue surfaces in substantially sealing relation therebetween; and connecting means for connecting the aperture of the mounting assembly and the stovepipe in exhaust flow relation.

4,527,542

OVEN VENTILATING SYSTEM

Michael E. Bales, New Palestine, and Wallace E. Schmidt, Carmel, both of Ind., assignors to The Maytag Company, Newton, Iowa

Filed Jun. 18, 1984, Ser. No. 621,946
Int. Cl.³ F24C *15/20*
U.S. Cl. 126—299 D **11 Claims**



1. A venting system for a range including surface heating units, self-contained proximity ventilation apparatus and an oven, comprising: proximity ventilation air intake means in the top surface of said range adjacent said heating units; plenum means within said range and communicating with said air intake means; duct means for conducting fumes to atmosphere outside of the kitchen environment of said range; proximity ventilation blower means within said range communicating with said plenum means and said duct means and operable for exhausting cooking fumes from the environment adjacent said top surface through said air intake means, said plenum means and said duct means to said atmosphere; oven exhaust vent means within said range and having an inlet in airflow communication with said oven for receiving oven exhaust fumes, said vent means including an outlet in the top surface of said range and in close juxtaposition to said proximity ventilation air intake means, said vent means conducting exhaust fumes from said oven to the environment adjacent said top surface for transfer to said air intake means under the urging of said blower means for exhausting to said atmosphere.

4,527,543

WATER HEATER CONSTRUCTION

Donald W. Denton, Ashland City, Tenn., assignor to State Industries, Inc., Ashland City, Tenn.

Continuation of Ser. No. 101,481, Dec. 10, 1979, abandoned.
This application Jul. 16, 1981, Ser. No. 283,983
Int. Cl.³ B65D *25/18;* **F24H** *1/18*
U.S. Cl. 126—361 **7 Claims**

1. A water heater comprising:

a tank means;

a jacket means surrounding said tank means and spaced therefrom to provide an insulating space therebetween, said jacket means including a cylindrical jacket member and a cover member mounted on the top of said jacket member to close off the top of the insulating space;

an insulating wall means mounted in said insulating space, said insulating wall means including an envelope member in the form of an elongated relatively thin tube; said envelope member having an inner tubular wall, an outer tubular wall spaced from the inner tubular wall, the space between said inner and outer tubular walls being enclosed at the lower ends thereof by a bottom wall, said inner and outer tubular walls being interconnected longitudinally by opposing end wall edges, the space between said inner and outer tubular walls at the top thereof being open; said insulating wall means further including a one-piece cylindrical wall of insulating material which has been foamed-in-place inside said envelope member, said insulating wall material comprised of a closed cell rigid polyurethane foam material having gas captured in the closed cells thereof.

4,527,544

HIGH INSULATING SOLAR BLOCK STRUCTURES

Rodney A. Wolf, Amherst Junction, and Alan G. Zech, Viroqua, both of Wis., assignors to Kimberly Hills, Ltd., Chicago, Ill.

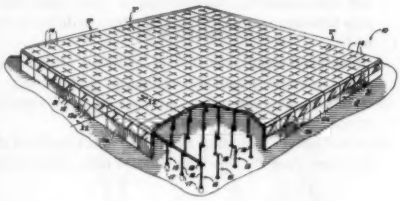
Filed Aug. 8, 1983, Ser. No. 521,248
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—419 **16 Claims**

1. A light-transmissive solar insulating block assembly adapted to being assembled in arrays to form at least a portion

of a structure having an exterior solar absorbing surface and an interior chamber to be heated comprising:

light-transmissive insulating block means defining at least one internal cavity substantially capable of maintaining a vacuum for insulating the interior chamber of the structure to be heated;

a housing supported on the block means having a light-transmissive cover providing an exterior surface and a plurality of support walls including a front and a rear wall extending between and separating said cover and said block means, said housing cooperating with said block means to define a circulation chamber therebetween, said front and



rear support walls defining a plurality of passageways for ingress and egress of air into and out of said chamber; and

fin means having two ends pivotally extending between the front and the rear wall of said housing for reflecting radiant heat back into said structure and controlling the amount of light passing through the chamber, a male fin connector attached to one end of the fin means and a female fin connector attached to the other end of said fin means, said connectors pivotally connecting the fin means to said housing, said connectors adapted to interlockingly engage and mate with connectors of adjacent modules in an assembled array.

4,527,545

SOLAR ENERGY SYSTEM AND SOLAR HEAT COLLECTOR

Augustinus W. M. Bertels, Arnhem, Netherlands, assignor to Nagron Steel and Aluminium B.V., Rheden, Netherlands

Filed Jun. 24, 1983, Ser. No. 507,333

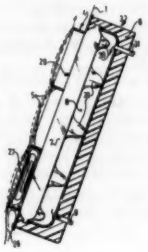
Claims priority, application Netherlands, Jul. 6, 1982, 8202713; Jul. 6, 1982, 8202714

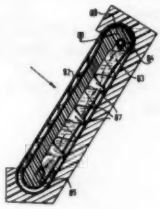
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—433 **19 Claims**

1. In a solar energy system, a dished housing formed of insulating material and defining a generally rectangular recess adapted to be disposed in a generally upright position and a solar panel filling said recess, said panel including closed loop recirculating means for vaporizing and then condensing a working liquid in recirculating, closed loop fashion, said recirculating means comprising a vaporizing leg lying at the opening of said recess and presenting a surface area thereat which is adapted to be impinged upon by solar energy, said vaporizing leg extending generally vertically so that vapor rises therein, said recirculating means also including a condensing leg lying within said recess in spaced relation to said vaporizing leg and extending generally vertically so that condensate flows downwardly therein ultimately to return to said vaporizing leg, insulating means lying behind and in contact with said vaporizing leg so as to concentrate heat input into said vaporizing leg, a heat collecting chamber in heat exchange contact with said condensing leg, and means for circulating liquid through said collecting chamber so as to condense vapor within said condensing leg and thereby maintain the recirculation of the working liquid in said closed loop recirculating means.

11. A solar panel for solar energy systems, comprising a generally rectangular housing formed of heat insulating material and defining a recess in one face thereof, solar heat exchange structure seated within said recess and a protective grid structure secured to said housing and serving to sandwich and maintain said heat exchange structure in bottomed position within said housing while reducing heat loss due to ambient wind conditions, said structure comprising closed loop recircu-





lating means for abstracting solar energy and including a vaporizing leg defining a solar energy heat absorbing surface area at the opening of said recess and upon which said grid structure bears to sandwich and maintain the structure in bottomed position within said housing.

4,527,546

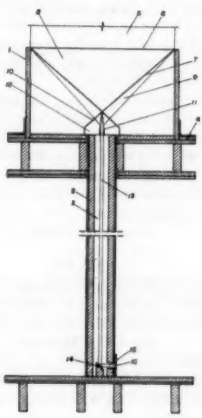
PRISMATIC WALL HEATER

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Aug. 1, 1984, Ser. No. 636,668

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—440 **1 Claim**



1. A prismatic wall heater comprising:

a. A prismatic beam concentrator (1) mounted at the top of two adjacent walls (2) and comprising an upper component prism (8) with a planar face (6) which transmits and two angular wedge faces (7) which refract a rectangular incipient beam (5) of diffused sunlight, forming two rectangular convergent beams (9), and comprising a lower component prism (12) with two angular wedge faces (10) which transmit and two angular V-groove faces (11) which refract beams (9), forming vertical concentrated sheet beam (13),

b. Two adjacent walls (2) separated by a cavity (3),

c. A planar mirror (14) mounted in cavity (3) at the base of two adjacent walls (2) and inclined at an angle of 45° to vertical concentrated sheet beam (13) so as to reflect beam (13), forming horizontal reflected beam (15), and

d. A radiant iron bar (16) mounted at the base of one wall (2) so as to intercept horizontal reflected beam (15) and absorb and radiate the heat thereof.

4,527,547

SOLAR HEAT COLLECTOR

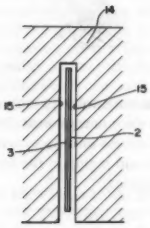
Kazuma Suzuki, Kumagaya, Japan, assignor to Kabushiki Kaisha Riken, Japan

Filed Nov. 5, 1982, Ser. No. 439,560

Claims priority, application Japan, Jan. 22, 1982, 57-7390[U]; Feb. 3, 1982, 57-13026[U]

Int. Cl.³ F24J *3/02;* **F28F** *3/14;* **B21D** *53/00*

U.S. Cl. 126—444 **4 Claims**



1. A solar heat collector comprising a pair of overlapped solar collector panels having a plurality of spaced welded seams defining therebetween a plurality of passages for a heat-transferring medium;

a plurality of circular or oblong welded seams at the ends of said spaced welded seams to prevent the ends of said first spaced seams from being cracked or torn when the panels are forced to bulge under pressure and also serving as flow restrictors for a heat transfer medium, wherein said ends of said spaced welded seams are staggered out of alignment transversely thereof;

a plurality of circular or oblong welded spots spaced from said circular or oblong welded seams in the longitudinal direction of said spaced welded seams to prevent the headers from being irregularly deformed when the panels are forced to bulge under pressure; and

two peripheral seams having an inlet and an outlet located at diagonally opposite ends.

4,527,548

WINDOW BLIND TYPE SOLAR COLLECTOR

Gary R. Gustafson, 700 W. 46th St., Minneapolis, Minn. 55409

Filed Feb. 9, 1984, Ser. No. 578,743

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—448 **3 Claims**

1. A window blind type solar collector for mounting and use as a window and usable with a working fluid as the heat transfer source, comprising:

a frame having a top and bottom and first and second sides, said frame including outlet and inlet manifolds along said first and second sides, respectively, through which the working fluid may flow during operation;

a first pane of transparent material mounted in said frame;

a second pane of transparent material mounted in said frame, parallel to said first pane and spaced from said first pane; and

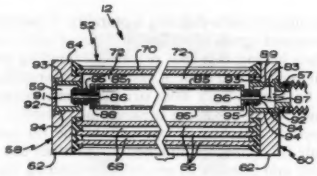
a plurality of louvers rotatably mounted between said first and second sides of said frame, each said louver including:

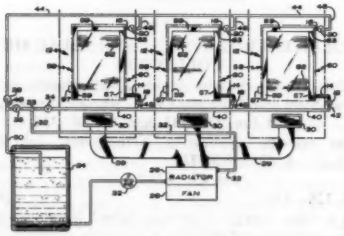
first and second ends positioned closely adjacent said first and second sides of said frame, each louver including a pair of substantially parallel, spaced apart edges extending between said first and second ends and each louver further including upper and lower sides with each louver side extending continuously in fluid tight relationship between said ends and said edges to define a louver wall;

an inlet opening at said first end of said louver and an outlet opening at said second end of said louver;

each of said inlet and outlet openings being of a predetermined cross sectional area;

each said louver including an interior working fluid channel permitting the working fluid to have direct contact





with said louver wall within said channel while flowing through said channel, said channel communicating with said inlet and outlet openings and said channel extending between said first and second ends and between said spaced apart edges and said upper and lower sides with said working fluid channel having a substantially larger cross sectional area than said cross sectional area of said inlet and outlet openings so the said channel fills each said louver to significantly increase heat transfer thereto;

said inlet and outlet openings connected to communicate with said inlet and outlet manifolds, respectively; and

means for rotating said plurality of louvers and interior working fluid channels in unison through at least 360° and maintaining said louvers substantially parallel to one another including:

a gear attached to each of said louvers adjacent said frame first sides; and

a plurality of idler gears rotatably mounted to said frame first sides, each of said idler gears being located

between and engaged with two adjacent louver gears.

4,527,549

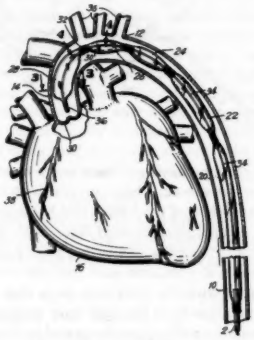
METHOD OF AND MEANS FOR INTRAAORTIC ASSIST

Shlomo Gabbay, Hartsdale, N.Y., assignor to Shelhigh Inc., New York, N.Y.

Continuation-in-part of Ser. No. 405,707, Aug. 5, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 430,039

Int. Cl.³ A61M *1/03*

U.S. Cl. 128—1 D **13 Claims**



4. In an intraaortic balloon pump of the type in which an inflatable balloon is attached to the end of a catheter for insertion into the aorta and having means for rythmically inflating and deflating said balloon through said catheter in rhythm with the normal heart beat, the improvement comprising forming said balloon of such size and the attached catheter of such length that the balloon may readily pass about the aortic arch to a position in the ascending aorta adjacent the aortic valve without damaging the arch and attached arteries, said balloon being larger on one side of said tube than on the other side, whereby said balloon assumes a partially arcuate shape to assist it in passing about the aortic arch, and said balloon pump further comprising an open pressure-measuring tube extending through said catheter and through said balloon.

4,527,550

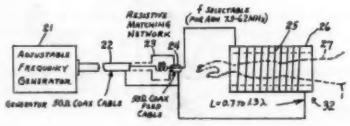
HELICAL COIL FOR DIATHERMY APPARATUS

Paul S. Ruggera, McLean, Va., and Gideon Kantor, Garrett Park, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 28, 1983, Ser. No. 461,954

Int. Cl.³ A61N *1/40*

U.S. Cl. 128—1.5 **14 Claims**



1. A diathermy apparatus comprising elongated hollow support means adapted to receive dielectric material to be heated, a coil surrounding said elongated support means substantially coaxially and comprising a plurality of turns, radio frequency generator means providing an output frequency in the range of from 7.5 MHz to 62 MHz, and means for connecting the output of said generator means to said coil, only the coil and the contents of said hollow support means acting as a load, the total wire length of said coil being about 0.7 to 1.3 times the fundamental wavelength corresponding to said output frequency.

4,527,551

CONNECTOR DEVICE FOR CHECKING LEAKAGE IN AN AIRTIGHT ENDOSCOPE

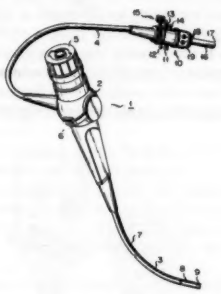
Fumiaki Ishii, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,313

Claims priority, application Japan, Jul. 27, 1982, 57-113548[U]; Jul. 27, 1982, 113549[U]; Jul. 27, 1982, 57-113550[U]; Jul. 27, 1982, 113551[U]; Jul. 27, 1982, 57-113552[U]

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **8 Claims**



1. A connector device for use in a system for checking air-leakage of an airtight endoscope, comprising:

an endoscope including an airtight endoscope body, a communication port extending from the endoscope body and having a passage for communicating between the inside and the outside space of the endoscope body, a valve mechanism formed of a valve seat and a movable valve body and arranged in close proximity to the distal end of the port, for opening and closing the passage of the port, operating means for selectively opening and closing the valve mechanism, said operating means including a movable retaining member provided in the vicinity of the port;

a supply connector adapted to be connected with the passage of the port in an airtight manner through said valve mechanism;

a supply line for communicating through the supply connector to the passage of the port and into the interior of the endoscope body, for supplying air to detect air-leakage between the inside and the outside space of the endoscope body; and

a retaining mechanism attached to the supply connector and adapted to communicate with the valve mechanism and engage the retaining member wherein the supply connector is removably held on the communication port by operation of the retaining member.

4,527,552

ENDOSCOPE APPARATUS

Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 358,183, Mar. 15, 1982, abandoned. This application May 18, 1984, Ser. No. 611,395

Claims priority, application Japan, Mar. 25, 1981, 56-43709

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **8 Claims**

1. An endoscope apparatus for performing an observation

mode, and in response to a release action of a camera, for performing a photographing mode comprising:

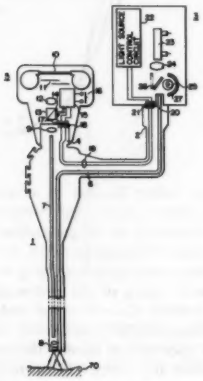
an endoscope having an eyepiece section, a light guide for guiding observation and photographing lights towards an object, an image guide for guiding light reflected from said object to said eyepiece section, and a signal transmission line;

a camera mounted on said eyepiece section and provided with a camera circuit including photoelectric means to produce a photoelectric signal corresponding to the brightness of light reflected from the object and transmitted through the image guide to said eyepiece section;

signal generator means for converting the photoelectric signal of said photoelectric means to an observation light control signal in the observation mode and for producing a sync signal in response to a release action of said camera and for converting the photoelectric signal to a photographing light control signal in the photographing mode;

signal transmitting means for supplying said signals to the signal transmission line in the endoscope; and

a light supply unit including an observation light source means for irradiating the observation light, a photographing light source means for irradiating the photographing light, and a signal discriminator circuit means connected to the signal transmission line in the endoscope to discriminate the observation light control signal, the sync signal and the photographing light control signal from one another and produce signals corresponding to these signals, respectively; said light supply unit further comprising



an observation light control circuit means for controlling the light of said observation light source in response to the discriminating signal corresponding to the observation light control signal, a photographing light control circuit means for causing said photographing light source means to irradiate light in response to the discriminating signal corresponding to the sync signal and for terminating the the light emission of said photographing light source means in response to the discriminating signal corresponding to the photographing light control signal; and wherein said signal generator means comprises

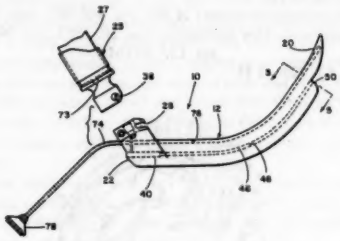
circuit means connected to said photoelectric means to perform the functions of (a) converting the photoelectric signal to an analog voltage signal to be used as as an observation light control signal, and (b) producing a sync signal in response to the release action, said generator means further comprising an integrator to provide the function of (c) integrating the photoelectric signal to generate an integrated signal, means for selectively switching said circuit means to perform the desired function, and means for comparing the integrated signal with a reference signal to generate digitally the photographing light control signal.

4,527,553

LARYNGOSCOPE WITH IMPROVED LIGHT SOURCE

Michael S. Upsher, 2957 Adeline Dr., Burlingame, Calif. 94010

Filed Apr. 28, 1980, Ser. No. 144,704
Int. Cl.[3] A61B *1/26*
U.S. Cl. 128—11 **35 Claims**



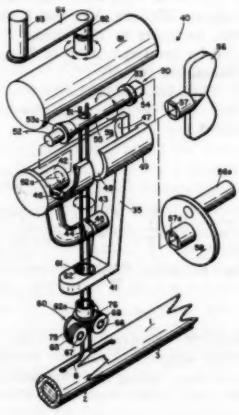
1. In a laryngoscope having a blade and a handle containing an electrical power source: a base integral with the blade, said base being independent of the handle and having a bore therein containing an electrically actuated light bulb in its entirety, said base having first means supporting a fiber optic radiation light guide thereon at a location such that one end thereof is in optical alignment with the bore and such that the radiation guide directs radiation from the light bulb outwardly from the base through said optically aligned one end to the opposite end of the guide at a region spaced from said one end, said base having second means thereon spaced from said bore for removably coupling the base including the source to the handle, whereby the base and handle are separable from each other, and third means thereon for making electrical connection between the light bulb and the power source in the handle when the base is coupled to the handle.

4,527,554

METHOD AND DEVICE FOR MAKING A TWISTED WIRE CONNECTION WITH REDUCED INCIDENCE OF BREAKAGE

Harvey A. Klein, 1000 E. 19th St., Brooklyn, N.Y. 11230

Filed Sep. 13, 1982, Ser. No. 416,900
Int. Cl.[3] A61F *5/04*
U.S. Cl. 128—92 B **19 Claims**



1. A method for making a twisted wire connection for hold-

ing objects together, with reduced incidence of breakage comprising the steps of;

(a) positioning a wire in holding juxtaposition with objects to be held together with said wire;

(b) tensioning the ends of said wire against buttressing means after said wire is positioned, whereby said wire holds said objects together; and

(c) twisting said tensioned wire ends into a tie whereby said wire connection is locked into a position for holding said objects together;

wherein said method comprises the steps of establishing a fixed axis, perpendicular to said objects being held together, along which axis said wire ends extend; tensioning said wire ends against at least one rolling element which moves together with said wire ends during tensioning, and wherein said wire ends and at least one of said rolling elements move in the same direction away from said objects and along said fixed axis during tensioning; whereby scoring or stressing of said wire ends, with resultant wire breakage, is substantially reduced or eliminated, and thereafter twisting said wire ends around said fixed axis.

4,527,555

AUXILIARY TABLE FOR EXTENSION AND REPOSITIONING IN MEDICAL OPERATIONS

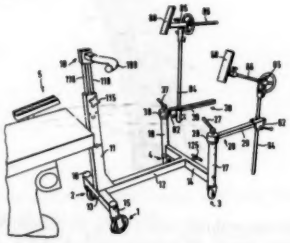
Hermann Ruf, Pfützenstr. 58, 6103 Griesheim, Fed. Rep. of Germany

Continuation of Ser. No. 379,452, May 18, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,144

Claims priority, application Fed. Rep. of Germany, May 18, 1981, 8114666[U]; May 19, 1981, 3119900

Int. Cl.[3] A61F *5/00*

U.S. Cl. 128—69 **42 Claims**



1. An auxiliary table for the medical treatment of an extremity in preparation for pinning of bones or the like, said table providing ready access to the treatment site by equipment and personnel and comprising:

a frame movable on rollers, said frame being formed by a horizontal longitudinal member (**12**) having a proximal end and a distal end, said member being fastened to the centers of horizontal transverse beams (**13, 14**) at each of said proximal and distal ends of said member;

a vertical support column fastened on the proximal end of said member and carrying a vertically adjustable mount (**19**);

two free-standing vertical posts, said posts being mounted at horizontally spaced apart locations on either side of the center of said distal end beam, each of said vertical posts carrying a vertically and pivotally adjustable extension device (**20, 30**), the horizontal spacing of said posts providing access to the treatment site from the distal end of said table

said member, mount and posts presenting an upstanding U configuration to the auxiliary table in side elevation, said U configuration being unobstructively open at the top to provide access to the treatment site from the sides of said table.

4,527,556

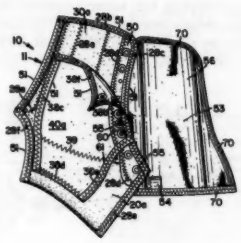
SUPPORT BRACE

Marvin G. Nelson, North Branch, Minn., assignor to Nelson's Upholstery, Inc., North Branch, Minn.

Filed Aug. 16, 1983, Ser. No. 523,681

Int. Cl.[3] A61F *3/00*

U.S. Cl. 128—80 H **26 Claims**



1. An ankle support for use in supporting an ankle bone and ankle joint, comprising:

(a) first and second flexible portions, each of said flexible portion comprising:

(i) a first section having a top, bottom, front side and a back side and outer and inner surfaces;

(ii) a second section having a front side, said second section cooperatively connected to said first section; and

(iii) a third section having a front side, said third section cooperatively connected to said second section, defining an open top pouch.

(b) means for cooperatively connecting said bottom of said second section proximate to said bottom of said first section;

(c) an elastic member having a first edge and second edge, said first edge cooperatively connected to said back side of said first section of said first portion and said second edge cooperatively connected to said back side of said first section of said second portion, whereby said first and second portions are cooperatively connected along their back sides and have a distance between them that may vary depending on the amount of elasticity of said elastic member;

(d) a plurality of spaced apart openings formed in said front sides of said first, second and third sections, adapted to receive a lacing laced through said openings to secure said front sides in a closed position; and

(e) wherein said openings in said first and second sections are aligned and corresponding openings in said third section are offset from said openings in said first and second sections generally downward and away from said front side, whereby when the lacing is tightened, said openings in said third section being offset causes said third section to be pulled up and over toward said front side.

4,527,557

MEDICAL VENTILATOR SYSTEM

Douglas F. DeVries, Redlands, and Arie Cohen, Walnut, both of Calif., assignors to Bear Medical Systems, Inc., Riverside, Calif.

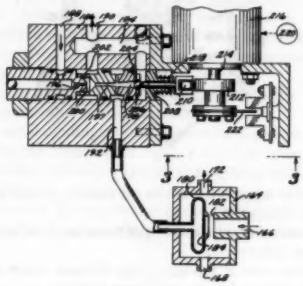
Filed Nov. 1, 1984, Ser. No. 667,115

Int. Cl.[3] A61M *16/00*

U.S. Cl. 128—204.23 **34 Claims**

30. In a ventilator system for providing artificial ventilation to a patient including a pressure regulated source of respiratory gas; flow control means for controlling the flow of the respiratory gas to the patient in accordance with a predetermined flow rate-versus-time function; flow sensing and transducer means for measuring the flow rate of the respiratory gas downstream of the flow control means and for generating a first electric signal indicative of said flow rate; exhalation valve

means in fluid communication with the flow of the respiratory gas and with the patient for providing an outlet to the ambient to proximal gases of the patient; pressure control means operatively connected with the exhalation valve means for controlling the exhalation valve means to maintain the proximal pressure in accordance with a predetermined pressure-versus-time function; and computer means for receiving the first electric signal, for providing the predetermined flow rate-versus-time function, for comparing the value required by the predetermined flow rate-versus-time function to the instantaneous flow rate as indicated by the first electric signal, and for generating and sending a corrective second electric signal to the flow



control means to regulate the flow control means, the improvement comprising:

a stepper motor included in the flow control means and having a rotatable shaft, an asymmetric cam mounted to the rotatable shaft and a cam follower operatively mounted to follow the cam in a substantially linear motion, the stepper motor being controlled by the corrective second electric signal, and

an adjustable flow control valve included in the flow control means and having an orifice interfacing with a valve body which is connected to the cam follower, whereby the stepper motor controls the flow rate.

4,527,558

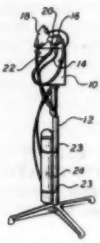
SCAVENGER SYSTEM

Richard Hoenig, East Aurora, N.Y., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Jun. 24, 1983, Ser. No. 507,396

Int. Cl.[3] **A61M** *16/00*

U.S. Cl. 128—205.24 **7 Claims**



1. A gas scavenger system for conveying waste exhalation gas to a vacuum system from an anesthetic apparatus having a demand valve for administering an anesthetic gas to a patient and having exhaust ports for normally passing the waste exhalation gas from the patient to atmosphere, said gas scavenger system comprising collection manifold means receiving the waste exhalation gas from the exhaust ports, surge chamber means connected to said collection manifold means and adapted to receive the waste exhalation gas therefrom, said surge chamber means having an outlet connectable to the vacuum system and having a valve means limiting the flow of gas from said surge chamber means to the vacuum system, said surge chamber means containing a predetermined volume to receive normal excess flows occasioned by exhalation from the patient, fixed resistance means forming a flow path between said surge chamber means and the surrounding atmosphere, said fixed resistance means comprising an elongated tube extending essentially within the interior of said surge chamber means, said tube having one end thereof open within said surge chamber means and having the other end open to surrounding atmosphere external of said surge chamber means, said tube containing a substantially hydrophobic substance having a known flow resistance and which allows the flow of gas through said tube to the atmosphere when the pressure in said surge chamber means exceeds a predetermined maximum value and allows the flow of gas through said tube to said surge chamber means from the atmosphere when the vacuum in said surge chamber means exceeds a predetermined value.

4,527,559

ENDOTRACHEAL TUBE ANCHORING MECHANISM

Dwight W. Roxburg, 3050 NE. 89th St., Seattle, Wash. 98115, and Linda M. Magnuson, 2357 N. 193rd St., Seattle, Wash. 98133

Filed Oct. 18, 1982, Ser. No. 434,774

Int. Cl.[3] **A61M** *16/00*

U.S. Cl. 128—207.17 **18 Claims**

1. An endotracheal tube comprising an elongated tube having an interior lumen, an exterior surface and a row of preformed apertures spaced longitudinally along and extending transversely of the tube for securing the endotracheal tube to a patient, each aperture being exterior to the lumen and defining a passage having opposite open ends terminating at the exterior surface of the tube, the tube having an exterior ridge extending longitudinally thereof and formed by a lateral portion of the tube wall having increased radial thickness, and wherein said apertures extend transversely through said ridge.

4,527,560

MEDICAL OR DENTAL PROBE WITH SELF-HEATING TIP AND METHODS FOR MAKING

Carl J. Masreliez, 3301 181st Pl. Northeast, Redmond, Wash. 98052

Filed Oct. 27, 1982, Ser. No. 437,158

Int. Cl.[3] **A61B** *17/38;* **A61C** *3/00*

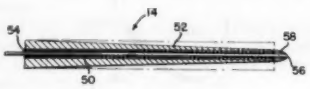
U.S. Cl. 128—303.1 **15 Claims**

1. A medical and dental probe comprising:

a probe base;

a tip projecting from said base, said tip having an inner conductive core member and an outer layer of resistive material surrounding said core member, said outer layer having a cross-sectional area along its length gradually decreasing toward a distal end of said tip to increase the electrical current density in said outer layer toward said

distal end upon passage of electric current, said core member and outer layer being connected to each other at the distal end of said tip and electrically isolated from each other along the remaining portion of said tip, the series combination of said core member and outer layer having a relatively high resistance and creating a lengthwise



temperature gradient in said outer layer increasing toward said distal end; and

means for passing an electric current between said core member and said outer layer away from the distal end of said tip, thereby causing current to flow through said outer layer and said core member to heat said tip.

4,527,561

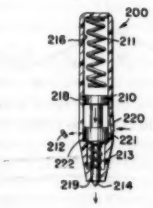
AUTOMATIC RETRACTABLE LANCET ASSEMBLY

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Division of Ser. No. 322,344, Nov. 18, 1981, abandoned, and a continuation-in-part of Ser. No. 246,523, Mar. 23, 1981, Pat. No. 4,388,925. This application Jan. 20, 1984, Ser. No. 572,336

Int. Cl.[3] **A61B** *17/34*

U.S. Cl. 128—314 **2 Claims**



1. An automatic retractable lancet assembly comprising:

a housing having an aperture;

a lancet movably mounted in said housing with its point lying substantially adjacent the interior side of said aperture;

a first spring mounted inside said housing in a substantially relaxed condition adapted to be compressed in a biased condition and further adapted to decompress upon release to cause the movement of said lancet outward of said aperture for penetration of the skin of a patient, said first spring adapted to become dissociated from further movement of said lancet after said lancet completes its outward movement;

actuating means for compressing said first spring into a biased condition and for retaining same until use, and for releasing same to cause the outward movement of said lancet;

said actuating means including a slidable member through said housing associated with said first spring and including a latching means so that said first spring is compressible by movement of said slidable member and is retained in position by cooperation with said latching means;

said slidable member being adapted to be forcibly removed from said assembly upon decompression of said first spring so that said first spring cannot be reloaded for a subsequent operation; and

a second spring mounted inside said housing in a substantially relaxed condition before said first spring is released and adapted to become biased when said first spring becomes dissociated from further movement of said lancet to cause said lancet to be automatically retracted back inside said housing.

4,527,562

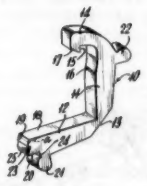
NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS

Robert W. Mericle, Lebanon, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 276,131, Jun. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 49,379, Jun. 18, 1979, abandoned. This application Apr. 5, 1983, Ser. No. 468,518

Int. Cl.[3] **A61B** *17/12, 17/00*

U.S. Cl. 128—325 **7 Claims**



1. A sterile hemostatic clip made from abosorable or nonabsorbable polymeric materials for application using a clip-applying instrument, said instrument having a pair of jaws for holding and placing said clip about the vessel to be ligated and for closing said clip to ligate said vessel, said clip comprising first and second leg members joined at their proximal ends by resilient hinge means and terminating at their distal ends in latch means, each leg member having an outer surface and a vessel clamping inner face, said vessel clamping inner face being in opposition to a vessel clamping inner face of the other leg member;

said first leg member terminating at the distal end thereof in a Portion of the latch means, said portion comprising a deflectable hook member extending from the inner face of said leg member, said hook member having an inner face spaced from the inner face of said leg member and substantially parallel thereto, the end face of said hook member being beveled so as to form an acute angle with the inner face of said hook member, said leg member having a boss disposed on a portion of its outer surface opposite the vessel clamping inner face, said boss having a substantially cylindrical shape with the axis of the cylinder extending across the width of the leg member, said boss adapted to rotably fit into a first jaw of the clip applying instrument and be held therein while the clip is being closed, said boss being spaced between the proximal and distal ends of the leg member;

said second leg member terminating at the distal end thereof in a complementary portion of the latch means, said portion comprising an end face of said leg member having a second bevel of supplementary angle to said acute angle on the end face of said hook member, said second bevel forming an obtuse angle with the inner face of said second leg member and adapted to deflect said hook member, said second leg member adapted to enter the space between the inner face of said hook member and the inner face of said first leg member with the end face of said leg member being enclosed by said hook member, said second leg member having a boss disposed on a portion of its outer surface opposite the vessel clamping inner face, said boss having a substantially cylindrical shape with the axis of the cylinder extending across the width of the leg member, said boss adapted to rotably fit into the second jaw of the clip applying instrument and be held therein while the clip is being closed, said boss being positioned so as to be

substantially in opposition to said boss on said first leg member when said clip is closed;

whereby when the pair of jaws of the clip applying instrument having a clip therein are closed, the bosses of said clip rotate within the jaws of the instrument to allow said first and second leg members to pivot about said hinge means and the distal end of the said second leg member to deflect and engage the hook member of the first leg member to lock the clip in a closed position and on subsequent opening of the jaws the clip is released therefrom.

4,527,563

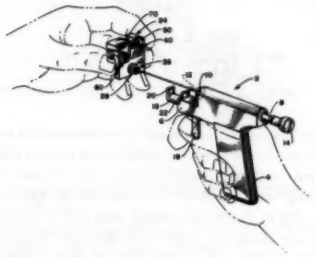
STERILE EARLOBE PIERCING ASSEMBLY

Vladimir Reil, 740 W. 16th St., San Pedro, Calif. 90731

Filed Jan. 12, 1983, Ser. No. 457,447

Int. Cl.³ A61B *17/34*

U.S. Cl. 128—329 R **7 Claims**



1. A sterile stud implacement system comprising the combination: a pistol-like member having a handle portion and a barrel portion, said barrel portion carrying a plunger for axial movement from a first, cocked position to a second, released position and being operatively connected to a trigger member, said trigger member having a clasp carrying portion and being positionable in a first, clasp carrying position and a second, clasp setting position, the triggering of said trigger member causing said plunger member and said clasp carrying portion to be forcibly driven towards each other to engage at an intermediate alignment member operably associated with said barrel portion the end surface of said plunger member having a recess receiving a separable and disposable stud driver wherein said stud driver has an integral construction having a solid, cylindrical portion adapted to be received in said plunger member and enlarged, annular flange and an extending, hollow, cylindrical portion adapted to loosely receive the head of a stud therein, said clasp carrying portion, intermediate alignment member and said stud driver being releasably and disposably retained in operative relationship for singular, sterile, stud and clasp implacement in an earlobe or the like.

4,527,564

SUTURING NEEDLE FOR MEDICAL OPERATION

Yasukata Eguchi, Tokyo; Reishi Nomoto, and Masayoshi Takahashi, both of Kanagawa, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Japan

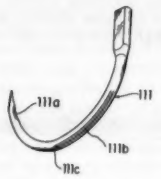
Filed Feb. 2, 1981, Ser. No. 230,581

Claims priority, application Japan, Feb. 6, 1980, 55-12813[U]; May 23, 1980, 55-70263[U]

Int. Cl.³ A61B *17/06*

U.S. Cl. 128—339 **5 Claims**

1. A suturing needle for use in medical operations, comprising a needle grip to be held by a suturing machine and an elongated curved portion formed with a needle eye to receive a needle thread, said curved portion having an outer surface and an inner surface of substantially circular shape, said outer surface being formed with an elongated thread guide groove for guiding the needle thread toward said needle eye, said elongated groove being provided with a checking portion



formed as to partially close said groove to thereby prevent the needle thread from slipping out from said groove.

4,527,565

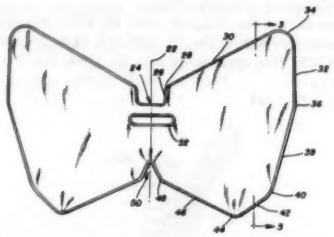
COLD FACIAL APPLICATOR

Billie J. Ellis, 9017 Finney Point Dr., Ooltewah, Tenn. 37363

Filed Feb. 27, 1984, Ser. No. 583,989

Int. Cl.³ A61F *7/10*

U.S. Cl. 128—402 **13 Claims**



1. A cold facial compress in the form of a mask for applying to the face of a person, said compress comprising two layers of flexible sheet material sealed about their peripheries to form a cavity, a coolant gel disposed in said cavity, said gel having the property of remaining pliable when cooled in the freezer compartment of a refrigerator, said sheet materials each having a peripheral configuration including a wide notch for disposition beneath and about the nose of the person, and a sharp notch spaced below said wide notch, said sheets being substantially symmetrical about a line extending through said notches, an upper edge extending upwardly from an edge at each side of said wide notch at an angular disposition to said line for extending substantially along the cheekbone of said person and terminating at a temple engaging edge, a side edge extending from said temple engaging edge and downwardly to a lowermost edge for tucking beneath the person's jawbone, a neck engaging edge extending upwardly to said sharp notch at an angular disposition to said line, and an opening disposed intermediate said notches to define an aperture about the lips of said person, the peripheral,border of the sheet material defininng said opening being sealed about the periphery.

4,527,566

BODY WRAP

Helena E. Abare, Forsyth, Ga., assignor to Abare Enterprises, Inc., Forsyth, Ga.

Continuation of Ser. No. 205,707, Dec. 17, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 464,633

Int. Cl.³ A61F *7/00*

U.S. Cl. 128—402 **5 Claims**

1. A flexible wrap for enveloping a selected portion of the human anatomy and supporting a thermal pack in heat transfer relation to the anatomical portion, the wrap comprising:

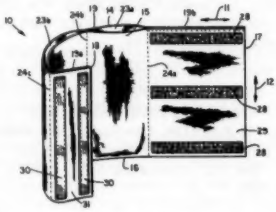
an elongated flexible band of material having sufficient overall length to wrap around a selected anatomical portion, and having substantial overall width less than said length; said band being substantially flat;

securement means connected to said band to detachably interconnect the ends of said band when wrapped around the selected anatomical portion, said securement means being operative to secure said band in snug wrapped engagement at any selected length between certain minimum and maximum circumferences of body portion encirclement;

said band being relatively inelastic in length, so as to remain in position snugly wrapped around said anatomical portion irrespective of body movement tending to cause lengthwise elongation of the band;

said band being relatively elastic in width so as to permit substantial lateral elongation of the band in response to distention of said anatomical portion during movement;

inelastic means extending across the width of said band adjacent an end thereof and operatively associated with the band to inhibit the widthwise elasticity of the band at said end, thereby rendering said end of the band relatively



inelastic in width as well as in length so as to assist in retaining the wrap in place around the anatomical portion; and

at least one compartment formed in said band to removably receive a quantity of thermal material, so that the thermal material in said compartment is in heat transfer relation with the anatomical portion about which said band is wrapped;

so that the lengthwise inelasticity of the band prevents elongation of the band and thereby maintains the band in place wrapped around an anatomical portion despite possible anatomical movement accommodated by the lateral elasticity of the band, and so that the inelasticity in both width and length at the end of the band prevents widthwise elongation at the end and thereby assists in retaining the flexible wrap in place on the anatomical portion.

4,527,567

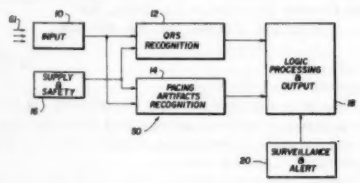
METHOD AND APPARATUS FOR AUTOMATICALLY EVALUATING THE QUALITY OF THE PERFORMANCE OF A CARDIAC PACING SYSTEM

Henryk Fischler; Yaakov Krupka, both of Rehovot, and Salamon Behar, Tel Aviv, all of Israel, assignors to Yeda Research & Development Company, Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 136,300, Apr. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 939,777, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 752,548, Dec. 20, 1976, abandoned. This application Jul. 26, 1982, Ser. No. 401,543

Int. Cl.³ A61N *5/04*

U.S. Cl. 128—419 PT **22 Claims**



1. A method for automatically evaluating the quality of the performance of a cardiac pacing system including a human heart and an electronic pacemaker, said method operating in a beat-to-beat on-line manner, comprising the steps of:

continuously sensing the electrical pontentials appearing on the body surface of the human whose heart is part of the cardiac pacing system;

determining the presence of a pacing artifact in said electrical potentials by analyzing for the presence of an artifact peak and comparing said peak's shape to the known shape of an artifact signal;

marking the appearance of each said pacing artifact by generating a pacing artifact determinant pulse signal defined in time and duration;

determining the presence in said electrical potentials of a QRS signal of either a spontaneous, paced separate or paced fused nature, including the steps of determining for the presence of a peak, comparing said peaks's shape to the known shape of a spontaneous or paced separate QRS peak, analyzing the time interval between the QRS peak and the occurrence of the previous pacing artifact, and analyzing the integral of the electrical potentials throughout a predetermined time interval after the occurrence of a pacing artifact;

marking the appearance of each said QRS signal by generating a QRS determinant pulse signal defined in time and duration; and

evaluating the interrelation between the heart and the pacemaker and the quality of the pacemaker function by analyzing the interrelationship of said pacing artifact and QRS determinant pulses.

4,527,568

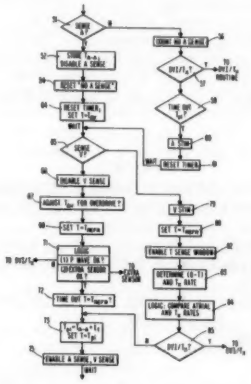
DUAL CHAMBER PACER WITH ALTERNATIVE RATE ADAPTIVE MEANS AND METHOD

Anthony F. Rickards, London, England, assignor to Vitafin N.V., Curacao, Netherlands Antilles

Filed Dec. 27, 1983, Ser. No. 566,101

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **21 Claims**



1. A dual chamber pacemaker, having means for sensing atrial heartbeat signals and means for sensing ventricular heartbeat signals, and means for delivering stimulus pulses at least to the ventricle, comprising:

atrial rate means for determining the rate of said sensed atrial signals,

QT means for sensing the ventricular QT interval and for determining an indicated pacing rate therefrom, comparison means for making a comparison of said indicated rate with the rate of sensed atrial heartbeat signals, and

control means for controlling the timing of said pacemaker

as a function of said indicated rate or as a function of sensed atrial signals depending upon said comparison.

4,527,569

DEVICE FOR GUIDING A SURGICAL NEEDLE INTO A BLOOD VESSEL

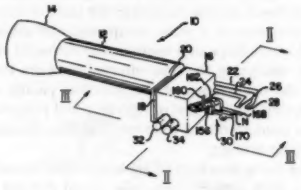
Peter J. Kolb, Cape Town, South Africa, assignor to South African Inventions Develop. Corp., Pretoria, South Africa

Filed Nov. 15, 1983, Ser. No. 551,724

Claims priority, application South Africa, Nov. 26, 1982, 82/8736

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **7 Claims**



1. A device for guiding a surgical needle into a blood vessel which device comprises first ultrasonic transducer means for producing an ultrasonic beam, second ultrasonic transducer means spaced from the first transducer means and serving to receive reflected ultrasonic waves, the transducer means being orientated such that there is a point of convergence between the axis of the ultrasonic beam produced by the first transducer means and the axis of the line of sight along which the second transducer means receives reflected waves, means for mounting the first and second transducer means for relative movement thereby to enable the distance between said point of convergence and the transducer means to be varied, means for mounting a surgical needle, and linkage means between said needle mounting means and the means for mounting the first and second transducer means, said linkage means displacing said transducer means relative to one another when the needle mounting means is moved, relative displacement of the transducer means being in such manner that the axis of a needle carried by the needle mounting means continuously intersects said point of convergence and is skew to the plane which contains said axis of the ultrasonic beam and said axis of said line of sight.

4,527,570

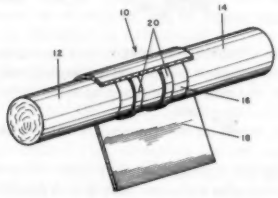
DEVICE FOR MANUFACTURING A MOUTHPIECE AND ATTACHING MOUTHPIECES TO CIGARETTE TOBACCO COLUMNS

Harry S. Porenski, and James W. Sullivan, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Oct. 12, 1983, Ser. No. 541,171

Int. Cl.³ A24C *5/47, 5/52*

U.S. Cl. 131—94 **16 Claims**



1. A device for applying two paper rings around the circumference of a double length cigarette mouthpiece spaced apart from each other to opposite longitudinal sides of the transverse centerline of the double length mouthpiece, comprising:

a rotatable drum at least as wide as the length of a double length mouthpiece, the rotatable drum having a plurality of double length mouthpiece receiving notches formed in its periphery at spaced apart intervals therearound, the notches being oriented with their longitudinal axes substantially parallel to the axis of rotation of the drum; and,

a stationary wrapping block having an arcuate contact surface concavely facing the periphery of the drum, the arcuate contact surface of the wrapping block corresponding to the curvature of the peripheral surface of the drum and being spaced from the peripheral surface of the drum by a preselected distance less than the diameter of the double length mouthpiece, and two spaced apart contact zones spaced apart to opposite sides of the longitudinal centerline of the wrapping block adapted to contact longitudinally spaced apart portions of the double length mouthpiece, the contact zones being of a relatively soft, resilient material having a relatively high coefficient of friction with the mouthpiece.

4,527,571

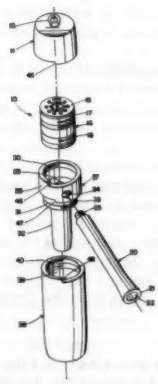
SMOKING PIPE ASSEMBLY

Spasa Djukic, 716 Judie Dr., Cleveland, Ohio 44109

Filed Jul. 6, 1983, Ser. No. 511,421

Int. Cl.³ A24F *3/00, 5/00, 7/02*

U.S. Cl. 131—329 **7 Claims**



1. A key chain pipe assembly comprising a tobacco receiving portion, a stem, a segmented hollow housing encircling said tobacco receiving portion and stem, means for assembly and disassembling of said tobacco receiving portion, stem and housing from a storage mode to a pipe smoking mode, and means for attaching said housing to a key chain or the like.

4,527,572

TOBACCO SMOKE FILTERS

John A. Luke, Hampshire, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 7, 1983, Ser. No. 464,524

Int. Cl.³ A24D *3/04*

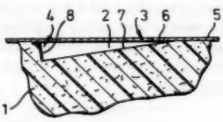
U.S. Cl. 131—336 **11 Claims**

4. In a smoke filter including:

(a) rod-like plug means of filtration material having a longitudinal axis, a mouth end, an opposed inlet end, and first and second axially consecutive regions with said second region near the mouth end,

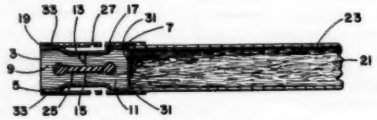
(b) airflow groove means at the periphery of said filter plug means, said airflow groove means having an air inlet end and an air outlet end; and

(c) Wrapping means enwrapping said filter plug means;
the improvement wherein:
(d) said airflow groove means are disposed in said first region of the filter plug means;
(e) the airflow groove means has a depth increasing in a direction from said airflow groove inlet end towards said airflow groove outlet end thereof;
(f) the airflow groove means, when viewed as a development of the filter plug means, has a component of its length which is transverse to said longitudinal axis of said filter plug means;
(g) said airflow groove means includes, at its outlet end, means defining an outlet face which is pervious to airflow;



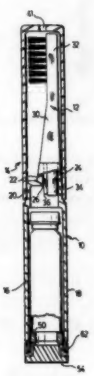
(h) airflow duct means defining ventilation airflow ducts extending along the filter plug means from the mouth end of the filter plug means along said second region and stopping short of said first region of said filter plug means; and
(i) said wrapping means includes means defining first ventilation perforations surrounding said first region of the filter plug means for communicating with said inlet end of said airflow groove means and means defining second ventilation perforations around said second region of said filter plug means for communicating with said ventilation airflow duct means, said second ventilation perforation means being spaced from said mouth end of the filter plug means.

4,527,573
FILTER CIGARETTE
Max Hausermann, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Nov. 5, 1982, Ser. No. 439,588
Int. Cl.³ A24B *3/04*
U.S. Cl. 131—336 **4 Claims**



1. A filter cigarette, comprising a tobacco rod, a wrapped substantially cylindrical filter plug having a first mouth-end segment and a second, axially aligned, abutting rod-end segment, each of said segments having a face abutting the other of said segments, means joining said first and second segments such that the first segment is rotatable about the common axis, means joining the second segment to the tobacco rod, and air transmissive tipping paper, said tobacco rod and said filter plug being axially aligned in abutting end-to-end relation and circumscribed by said tipping paper, said filter plug having a mouth end and a rod end open to permit the passage of air and smoke, said wrapping being substantially air impermeable and having a plurality of first longitudinally extending, substantially air impermeable depressions spaced about the circumference of the first segment extending from a position intermediate the ends of the first segment to the second segment, said first depressions being registrable with corresponding second, longitudinally extending, substantially air impermeable depressions spaced about the circumference of the second segment, such that as the first segment is rotated relative to the second segment, the degree of registry of the first and second depressions varies, thereby varying the amount of air admitted to the interior of the filter plug, a minimum amount of air being admitted when said depressions are fully in registry, and a maximum amount of air being admitted when said depressions are fully out of registry such that said abutting faces are exposed in the ends of said depressions.

4,527,574
PORTABLE DENTAL KIT
John A. Manfredi, 309 Nelson St., Brantford, Ontario, Canada N3S 4E2
Filed Mar. 25, 1983, Ser. No. 478,795
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—84 B **6 Claims**



1. A portable dental kit comprising;
a handle having two ends, and a toothbrush attached at one end of said handle, the other end of said handle being open, and said handle defining a hollow interior;
removable cover means for said toothbrush;
toothpaste container means shaped and adapted to be inserted into said hollow handle, through said open end, said container means having first and second ends and a flexible tubular side wall;
a dispensing opening and dispensing cap at a first end thereof;
a rigid filling member fitting at least partly into said tubular side wall at said second end of said container means, said filling member having an inner surface defining a filling passageway for insertion of toothpaste into said container means, and having an outer surface defining retention formations thereon engaging the interior of said tubular side wall;
threaded means on said filling member, and a filling cap removably attachable thereto for removably losing said filling passageway;
a clamping collar fitting around a portion of said flexible tubular side wall and said filling member, said collar gripping and deforming said tubular side wall and forcing same to conform to said retention formations on said filling member, thereby fastening said side wall to said filling member, said filling cap being separate from said clamping collar and being removable for filling of said container means through said filling passsageway in said filling member, and,
said clamping collar having an exterior surface shaped to conform to the exterior of said handle.

4,527,575

CONTOURED FLOCKED COSMETICS BRUSH FLEXERS

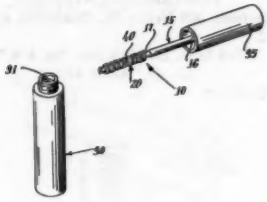
Martin M. Vasas, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Co., Bridgeport, Conn.

Continuation-in-part of Ser. No. 301,636, Sep. 14, 1981, Pat. No. 4,404,977. This application Sep. 19, 1983, Ser. No. 533,784

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.[3] A45D *40/26*

U.S. Cl. 132—88.7 **25 Claims**



1. A cosmetics applicator brush comprising:

(A) a rod;

(B) a flexer positioned at the end of the rod, the flexer having ribs extending outwardly from a core of the flexer with the ribs defining grooves therebetween, the ribs being sized, configured and deployed to provide a profile shaped with respect to the longitudinal axis of the flexer; and

(C) bristles secured to the exterior of said ribbed flexer and extending outwardly therefrom, said bristles deployed on both of said rib and grooved portions.

4,527,576

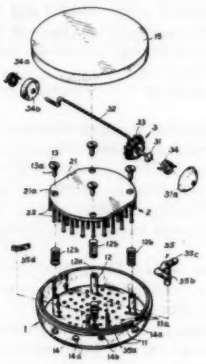
RETRACTABLE COMB AND BRUSH

Fargo Chou, 10-4 Fl., No. 62, Chang Chun Rd., Taipei, Taiwan

Filed May 10, 1984, Ser. No. 608,895

Int. Cl.[3] A45D *24/10*

U.S. Cl. 132—123 **4 Claims**



1. A retractable comb and brush comprising:

a casing having a perforated pad drilled with plurality of bristle holes thereon, several bristle-extending guides formed inside said pad and each jacketed with a tension spring, a cylindrical wall disposed on said perforated pad and a cover fixed on said cylindrical wall; a bristle means having a bristle base formed with several holes to be jacketed onto said bristle-extending guides and defined by limiting caps each inserted into pin hole of each said bristle-extending guide, and plurality of bristles fixed on said bristle base; and

a bristle extender having a rotating knob, a raising arm formed as U-shaped to raise said bristle means, a positioning gear fixed between said raising arm and said rotating knob, two retaining springs of which first spring is fixed on said casing wall and on said positioning gear and second spring fixed on said wall and a disk opposite to said first spring, and a releasing means which includes a pivot for rotatably mounting said releasing means on said casing, a releasing button extending outside said casing, a latch normally engaging with said positioning gear and a spring plate resiliently biasing said latch to lock said positioning gear, whereby said knob can be rotated to raise said bristle means and when depressing said releasing button, said bristles can be automatically retracted with said perforated pad by resilience stored during rotation of said rotating knob.

4,527,577

DEVICE FOR AUTOMATIC CASHIERS FOR STORING COINS

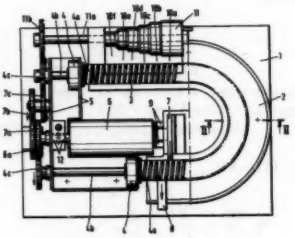
Gert Miller; Franz Diers, both of Monchen-Gladbach, and Hans-Josef Hermanns, Korschenbroich, all of Fed. Rep. of Germany, assignors to Scheidt & Bachmann GmbH, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,567

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304336

Int. Cl.[3] G07D *3/00;* **G07F** *5/10*

U.S. Cl. 133—3 H **6 Claims**



1. A device for automatic cashiers of, for example, vending machines, for storing coins; said device comprises:

a coin slot;

a storage channel which communicates with said coin slot;

a coin return slot which communicates with said storage channel; said coin slot and said return slot essentially being disposed on opposite sides of said storage channel;

means in communication with said storage channel for collecting coins therefrom;

a spiral spring disposed in said storage channel and having spring turns of receiving between adjacent ones thereof a single coin; said storage channel being constructed as a lateral guide for said spiral spring; said return slot being offset relative to said coin slot by at least one pitch of said spiral spring;

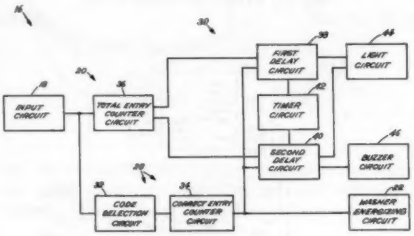
a motor for turning said spiral spring at least one full turn in either direction; and

said storage channel having a V-shaped cross section, including a linear first leg which exceeds the diameter of said spiral spring, a curved second leg which conforms to the curvature of said turns of said spiral spring, and a rounded-off portion by means of which said first and second legs are connected to one another; and also said curved second leg encloses said spiral spring over an arc of greater than 90°.

4,527,578
AUTOMATIC VEHICLE WASHER

Julian L. Klein; James A. Nelson, both of Des Moines, and Terrence J. Smith, Ames, all of Iowa, assignors to Ryko Manufacturing Company, Grimes, Iowa

Filed Sep. 26, 1983, Ser. No. 535,647
Int. Cl.³ B60S *3/04*
U.S. Cl. 134—57 R **6 Claims**



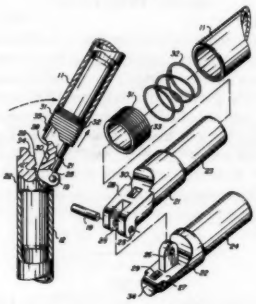
1. A vehicle washer comprising, in combination:
a vehicle washing apparatus;
an electrical power source;
input means for receiving a manual input and responsively providing an input signal;
verification means, interconnected to said input means, for storing a predetermined code, receiving said input signal, and producing a run signal when said predetermined code and input signal coincide;
activation means, interconnected to said verification means, for receiving said run signal and responsively interconnecting said electrical power source with said vehicle washing apparatus;
total entry counter means, interconnected to said input means, for receiving said input signal and issuing a first completion signal upon receiving said input signal;
delay means, interconnected to said total entry counter means, for receiving said first completion signal, counting for a predetermined period of time, and responsively issuing a first alarm signal during said predetermined period of time, said delay means further including inhibit means, interconnected to both said verification means and total entry counter means, for receiving said run and first completion signals and responsively providing a clear signal upon receiving both said first completion and run signals during said predetermined period of time; and
alarm means, interconnected to said delay means, for receiving said first alarm and clear signals and issuing an alarm upon receiving said first alarm signal.

4,527,579
CANE

David G. Knotter, 4634 N. 44th St., Phoenix, Ariz. 85018, and Jody L. Numbers, Scottsdale, Ariz., assignors to David G. Knotter, Phoenix, Ariz.

Filed Mar. 7, 1983, Ser. No. 472,968
Int. Cl.³ A45B *9/00;* **F16C** *11/10*
U.S. Cl. 135—74 **2 Claims**

1. A lockable hinge mechanism for connecting axially aligned tubular sections and permitting one section to be swung along side of the other section, a first hinge link carried by one of said tubular sections and having means for retaining a hinge pin at the distal end thereof and laterally displaced from the axis of the link, a hinge pin in said retaining means, a second hinge link carried by the other tubular section and having means spaced from the distal end thereof engaging said hinge pin, said first hinge link having a portion thereof on the side opposite said hinge pin retaining means cut away to receive a matching distal extension of said second hinge link, a locking sleeve slidably carried by said first hinge link and movable to a position in which a portion of the sleeve encompasses said first hinge link and a portion of the distal extension of said second hinge link for locking said links in axial alignment, said locking sleeve being movable along said first hinge link to release said second hinge link, spring means urging said locking sleeve in position to lock said links, said second hinge link having a cam surface on the distal end thereof for engaging and moving said locking sleeve out of locking position as said hinge links are brought into alignment, shoulder means on

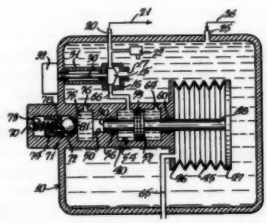


said first hinge link for limiting movement of said locking sleeve under the urging of said spring when the links are out of axial alignment to position the sleeve for engagement by the cam surface on the second hinge link when the links are brought into alignment, and interlinking means associated with the distal extension of said second hinge link and with said cut away portion of said first link to further reduce the opportunity for the links to be displaced laterally or twisted out of alignment by external forces when the links are in axial alignment.

4,527,580
VOLUME CONTROL DEVICE

Nemjee R. Chheda, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 25, 1983, Ser. No. 554,946
Int. Cl.³ F15B *1/06*
U.S. Cl. 137—1 **17 Claims**



16. A method for controlling the volume of oil in a reservoir which during operation holds oil under pressure and supplies oil to a pump in a closed circuit which returns the oil to the reservoir by use of a bellows assembly connected to a member and which contracts to move the member to open a dump valve for dumping oil from the reservoir upon a predetermined increase of oil volume comprising, positioning the bellows assembly in the reservoir with said member positioned to, upon movement, open the dump valve whereby an increase in oil volume causes contraction of the bellows assembly to open the dump valve, and applying the pressure of pumped oil to said member to oppose contraction of said bellows assembly whereby contraction of said bellows assembly is not dependent on the pressure of oil within the reservoir.

4,527,581

COMPOSITIONS FOR AND METHOD OF REDUCING HYDROCARBON FLUID FRICTION LOSS IN CONDUITS

John Motier, Glen Mills, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 230,775, Feb. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 142,330, Apr. 21, 1980, abandoned. This application Jun. 23, 1983, Ser. No. 507,308

Int. Cl.[3] F17D *1/16*

U.S. Cl. 137—13 7 Claims

1. A process for reducing friction loss in hydrocarbon liquids flowing through conduits comprising adding to the hydrocarbon liquids, in an amount varying from the minimum amount effective to reduce friction loss to about 1000 ppm, a copolymer of butene-1 and at least one other alpha-monoolefin having 5 to 20 carbon atoms and having a weight average molecular weight of at least about 1 million, said copolymer containing about 10 to 90 mole percent units derived from said other alpha-monoolefin component based on the total number of moles of butene-1 and said other alpha-monoolefin component in the copolymer.

4,527,582

DEPTH RESPONSIVE GAS CONTROL DEVICE

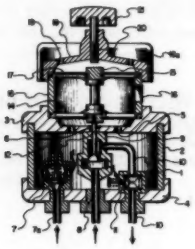
Brian L. Buckle, and Neil C. Heesom, both of Colwyn Bay, United Kingdom, assignors to Buoyco (Divers) Limited, United Kingdom

Filed Dec. 9, 1982, Ser. No. 448,208

Claims priority, application United Kingdom, Dec. 11, 1981, 8137472

Int. Cl.[3] F16K *17/36*

U.S. Cl. 137—81.2 10 Claims



1. A gas control device responsive upon reaching a selected predetermined depth in an ambient fluid comprising:

means defining a substantially fixed volume, closed gas reservoir for containing a quantity of a gas at substantially a predetermined pressure indicative of said selected predetermined ambient fluid depth;

pressure sensing means in operative communication with said ambient fluid and said gas in said gas reservoir for (a) monitoring the difference in pressure between said gas in said gas reservoir and the ambient fluid and (b) providing a control signal in response to the pressure of the ambient fluid exceeding said predetermined pressure of said gas;

means defining a flow path in fluid isolation from said gas in said gas reservoir at least when said gas in said gas reservoir is at a pressure less than a maximum pressure, said maximum pressure being greater than said predetermined pressure, said flow path having inlet and outlet ends between which a working fluid is capable of flowing; and

gas supply valve means operatively connected to said pressure sensing means to receive said control signal and being in communication with said flow path, said gas supply valve means having open and closed positions for respectively opening and closing fluid communication of said flow path between said inlet and outlet ends and for moving to said open position in response to receiving said control signal to thereby permit working fluid to flow in said flow path when said predetermined depth is reached.

4,527,583

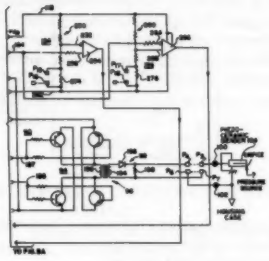
ELECTROPNEUMATIC TRANSDUCER SYSTEM

Donald C. Simpson, Norton, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 12, 1983, Ser. No. 513,162

Int. Cl.[3] F15B *5/00*; G05D *23/00*

U.S. Cl. 137—82 18 Claims



1. In a pneumatic system having a chamber which is in fluid communication with a source of pressurized gas, an outlet nozzle open to an outlet orifice, and an outlet conduit whose internal pressure is a function of the flow of fluid through said outlet orifice, a control system, comprising:

a comparator defining two inputs and one output;

signal supplying means, connected to one input of said comparator, for supplying an electrical signal characteristic of the pressure to be maintained within said outlet conduit;

electro-pneumatic means, defining a bridge of piezo-resistors whose resistance varies in response to the pressure within said outlet conduit, for supplying an electrical signal which is a characteristic of the actual pressure within said outlet conduit;

voltage sensitive nozzle flapper means, mounted adjacent the outlet orifice and electrically connected to the output of said comparator, for regulating the flow of fluid out of the outlet conduit;

an amplifier defining an inverting input, a noninverting input, and an output which is connected to the other input of said comparator;

constant current generator means, connected between one corner of said bridge of piezo-resistors and said amplifier output, for supplying constant current through at least one of said piezo-resistors;

a regulated voltage supply, whose output is connected across the two corners of said piezo-resistor bridge which are adjacent said one corner, for supplying regulated voltage to said electropneumatic means; and

a voltage divider circuit, connected across the output of said amplifier, for supplying a voltage signal to a corner of said bridge of piezo-resistors opposite said one corner, said one corner and said opposite corner of said bridge being connected to the inputs of said amplifier.

4,527,584

AUTOMATIC CONDENSATION DISCHARGER

Allan S. Miller, Hereford, England, assignor to Hiross International Corp., S.A., Luxembourg, Luxembourg

Filed Jul. 16, 1982, Ser. No. 399,014

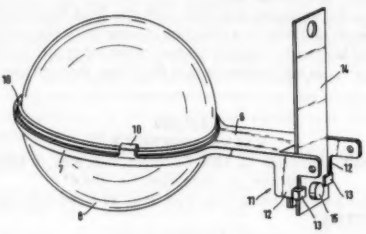
Claims priority, application Luxembourg, Aug. 21, 1981, 83505

Int. Cl.[3] F16T *1/24*

U.S. Cl. 137—192 22 Claims

22. The condensation discharge of claims 12 including:

vertical support means, said support means being attached to said tank collection means; and wherein:



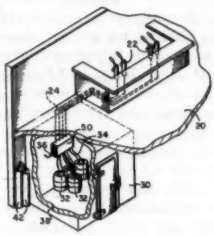
a first end of said support means is attached to one end of said elastic blade and wherein a second end of said support means is attached to said second end of said arm.

4,527,585

AUTOMATIC BEVERAGE TUBE CLEANER

Paul J. Mirabile, 100 Sparango La., Plymouth Meeting, Pa. 19462

Filed Jun. 22, 1983, Ser. No. 506,859
Int. Cl.³ B08B *3/04, 9/06*
U.S. Cl. 137—240 **10 Claims**



1. An automatic cleaning apparatus for beverage delivery systems of the type having at least one conduit for carrying the beverage in a delivery direction from a pressurized beverage source to an output, the apparatus comprising:

a first valve disposed in said conduit and controllably closable to isolate the beverage source from a downstream part of the conduit in said delivery direction;

a pump, and pump valve in series with the pump, an inlet to the pipe being connected to the downstream part of the conduit and an outlet of the pump being connected to a drain, the pump and pump valve controllably operable to provide a fluid connection between the conduit and the drain and operable to forceably discharge the conduit opposite said delivery direction to the drain;

a second valve connecting the downstream part of the conduit and a pressurized clean water source, the second valve being controllably operable to carry clean water to conduit;

a third valve and one-way valve connecting the downstream part of the conduit to an unpressurized cleaning solution reservoir, the one-way valve siphoning cleaning solution from the reservoir to the third valve, and thereby to the conduits; and,

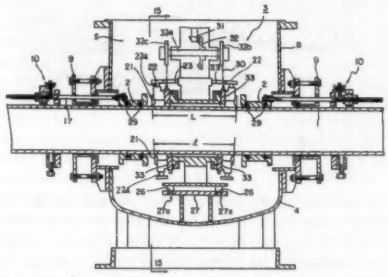
a controller connected to the pump and to the first, second and third valves, the controller sequencing operation of the pump and first, second and third valves in a conduit cleaning mode, the controller alternately isolating the beverage source, flushing and draining the conduit with cleaning solution and with clean water.

4,527,586

STRUCTURAL KIT FOR THE INSTALLATION OF A FLOW REGULATOR VALVE

Masatoshi Yano, and Kiyoshi Hamamoto, both of Suita, Japan, assignors to Yano Giken Co., Ltd., Japan

Continuation-in-part of Ser. No. 316,821, Oct. 30, 1981, abandoned, which is a division of Ser. No. 3,096, Jan. 12, 1979, abandoned. This application Jan. 9, 1984, Ser. No. 568,947
Claims priority, application Japan, Sep. 25, 1978, 53-118242
Int. Cl.³ F16L *41/04*
U.S. Cl. 137—318 **3 Claims**



1. Structural kit for the installation of a flow regulator valve in an intermediary portion of a pipeline which is under operating pressure comprising, a sealed housing which is air tight and fluid tight with respect to the ambient atmosphere and which confines a working space around the pipeline portion, a pipe cutter for cutting out a section of the pipeline, said pipe cutter being vertically movable in the working space and removable from the housing, said pipe cutter having a pair of ring-shaped gears which may be separated respectively into two sections to be set around the pipe and which have cutting tools on the side wall thereof which are slidable in the direction of the axis of the pipe, a device for driving the pipe cutter disposed outside of the housing, a shut-off valve for shutting off a vertical intermediary portion of the working space in the housing for partitioning the space, clamping rings having packings on their inner circumference capable of being mounted on the pipeline at each longitudinal side of the installation area within the housing, clamping-ring setters disposed outside of the housing along the pipeline for displacing the clamping rings along the pipeline for connecting the flow regulator valve to the line ends created when the pipe section is cut out, characterized in that each of the said ring-shaped gear is such constructed that a plane of the ring-shaped gear is tilted against a plane perpendicular to the axis of the pipe so as to cut away the pipe section the upper portion of which is longer than that of the bottom portion thereof.

4,527,587

CONNECTOR ASSEMBLY FOR A GAS

George R. Fairlamb, Bridgehampton, N.Y., assignor to Union Carbide Canada Limited, Toronto, Canada

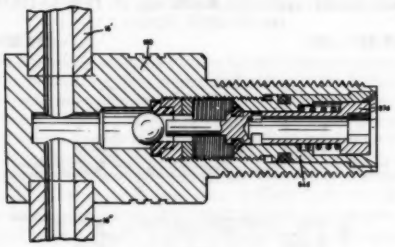
Filed Mar. 28, 1983, Ser. No. 479,532
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—329.3 **7 Claims**

1. A valve assembly for dispensing a gas into the connector of a gas using device, comprising:

(a) an outer body with an internal passageway for gas opening through the front end of the outer body, said passageway containing a valve seat and a valve member which is lifted from said valve seat by rearward pressure;

(b) an inner body threaded into said passageway from the front end of the outer body and having an internal opening with which said passageway defines a continuous passage through said assembly;

(c) an axially moveable plunger within said internal opening, said plunger including an activating member adapted to hold the valve member away from the valve seat when the plunger is moved axially in the direction of said outer body, a portion of the plunger having a non-round section complementary to and fitting within a non-round section



of the inner body whereby the plunger can be rotated using a suitable tool thereby rotating the inner body and disconnecting said inner body from said outer body, and

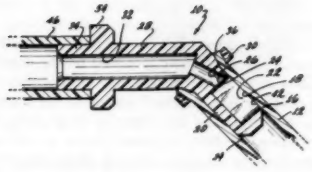
(d) an opening in said plunger for providing a passage for gas between said passageway and said internal opening when the plunger is moved towards the valve seat.

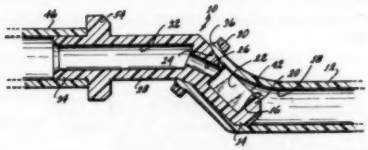
4,527,588

SAFETY VALVE

Gus G. Tseo, San Diego, and Mark E. Alpen, Escondido, both of Calif., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 14, 1983, Ser. No. 561,481
Int. Cl.³ F04B *43/12*; F16K *31/58*
U.S. Cl. 137—565 **8 Claims**





1. A safety valve for permitting the flow of fluid through a resilient tube operatively associated with a fluid flow device comprises:

a valve body formed with a fluid passageway therethrough having an inlet and an outlet;

a valve head formed with a peripheral land and connected to said valve body with the outlet intermediate the inlet and said valve head;

a resilient tube attached to said valve body for fluid communication with said outlet and disposed around said valve head for fluid sealing engagement between the inside surface of said tube and the surface of said land on said valve head when said tube is disengaged from the fluid flow device;

means for fixedly connecting said valve body relative to the fluid flow device; and

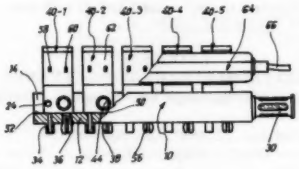
means for engaging said tube with the fluid flow device to distort said tube in a direction transverse to the surface of said land to disengage a portion of the inner surface of said tube from said land to permit fluid flow through said tube.

4,527,589

VALVE ASSEMBLY

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,614
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215782
Int. Cl.³ F15B *13/043*
U.S. Cl. 137—596 **10 Claims**



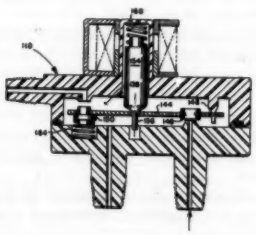
1. A valve assembly, comprising a base plate and a plurality of switching valves seated on an assembly face on said base plate; said base plate having a supply duct formed therein and branch ducts which run off from said supply duct and communicate with said valves by way of first ports in said assembly face and by way of inlet transfer ports of said valves; said base plate having terminal ducts which communicate with working ports of said valves, said terminal ducts being designed for supplying loads; and said base plate further having a common air outlet duct for all said valves, said outlet duct having branch ducts which open through second ports in said assembly face and communicate with outlet transfer ports of said valves; wherein said valves are made with positioning pins which fit into holes provided in said base plate for making certain that said transfer ports of said valves are aligned with respective said ports of said base plate on putting such valves in place thereon.

4,527,590

A.C. SOLENOID THREE WAY PILOT VALVE

Lawrence A. Kolze, Bensenville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 412,480, Aug. 30, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 679,110
Int. Cl.³ F15B *13/044*
U.S. Cl. 137—596.17 **4 Claims**



1. A single-pole double-throw valve comprising:

(a) body means defining a fluid pressure valving chamber

having a single inlet and plural outlet ports and a valve seat disposed about said inlet and one of said outlet ports;

(b) elongated lever means disposed in said chamber mounted on said body means for pivotal movement about a fulcrum disposed in said chamber adjacent one end of said lever means with said inlet valve seat intermediate said fulcrum and said one outlet valve seat, said lever means including poppet means adjacent each of said inlet and said one outlet valve seats and moveable between a first position closing said inlet valve seat leaving said one outlet valve seat open, and a second position opening said inlet and closing said one outlet;

(c) means biasing said lever means about said fulcrum in a direction to close said one outlet valve seat;

(d) armature means disposed in said chamber for movement between an extended position and a retracted position, said armature means operative in said extended position to contact said lever means intermediate said inlet and said one outlet valve seats and operative to limit movement of said lever means under the urging of said lever bias means;

(e) means biasing said armature means to the extended position;

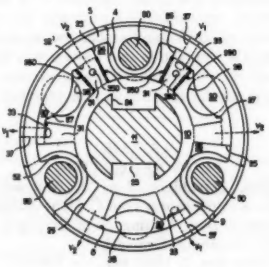
(f) magnetomotive force means including magnetic pole means and operative upon actuation to overcome said armature bias means and to effect movement of said armature means from said extended position to said retracted position wherein said poppet adjacent said one valve seat is moved a greater distance when said poppet adjacent said inlet valve seat.

4,527,591

HYDRAULIC ROTARY DISTRIBUTOR WITH A STAR-SHAPED ROTOR, MORE PARTICULARLY FOR A POWER-ASSISTED STEERING MECHANISM

Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed May 2, 1983, Ser. No. 490,808
Claims priority, application France, May 26, 1982, 82 09134
Int. Cl.³ F15B *9/10, 13/04;* **F16K** *11/02*
U.S. Cl. 137—625.21 **5 Claims**



1. A hydraulic rotary distributor, more particularly for a power assisted steering mechanism, which comprises:

a housing having an axial bore;

a first rotary discoidal star-shaped valve member comprising a rotor fixed in rotation to an input shaft and having angularly spaced radial arms;

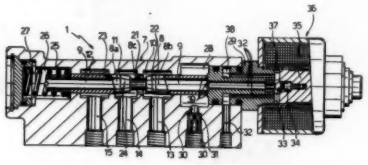
a second rotary valve member fixed in rotation to an output shaft and mounted for rotation within said bore, said second valve member being constructed by joining coaxially at least a first annular element and a second annular element with an intermediate annular spacer element therebetwen, said annular elements defining an inner discoid cavity having facing lateral walls and a peripheral wall within which is totally received in rotatable sliding sealing relationship the first valve member to define within said cavity at least two series of angularly offset chambers arranged to communicate selectively, upon relative rotational displacement of the first and second valve members, with fluid passages formed in said second valve member and opening into said cavity for establishing selectively fluid flow paths between a sorce of fluid under pressure and respective compartments of a hydraulic power-assistance motor, wherein the chambers of a first of said series of angularly offset chambers are formed in each of said arms of said rotor and each being delimited axially by said facing lateral walls of said cavity and angularly by radial edge web portions of the associated arm, the chambers of a second of said series of angularly offset chambers each being delimited between two adjacent first chambered arms of said rotor by said facing lateral walls and said peripheral wall of said cavity, said fluid passages including an inlet passage surrounding peripherally said annular spacer element and communicating permanently with said second chambers, distribution passages communicating respectively with first and second apertures each formed in a mirrorlike fashion in said facing lateral walls of said cavity and in line with and of substantially the same radial extent as said web portions of said arms, and return passages comprising axial bores extending through said second valve member and opening in said cavity on both sides axially of said first valve member and in permanent fluid communication with said first chambers formed in said arms, said annular elements of said second valve member being joined by fastening means each extending axially through a respective chamber of said second series of angularly offset chambers, said first series of chambers each having a wide radially outer curved edge with a profile having a convexity directed toward the axis of the rotor, the curved edges being positioned to partially close the associated return passages.

4,527,592

FLOW CONTROL VALVE FOR HYDRAULIC CIRCUITS

Giulio Dotti, Milan, and Bruno Roggero, Cinaglio, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 12, 1982, Ser. No. 397,015
Claims priority, application Italy, Jul. 17, 1981, 67989 A/81
Int. Cl.³ F15B *13/043*
U.S. Cl. 137—625.61 **4 Claims**



1. A flow control valve which can be connected between a source of fluid under pressure and a fluid utilizer, and between said utilizer and an exhaust to adjust the rate of flow of fluid from said source to said utilizer, and from said utilizer to said exhaust, said valve comprising a supply chamber in communication, through a supply duct, with said source, a utilization chamber in communication through a utilization duct with said utilizer, a discharge chamber in communication through a first discharge duct with said exhaust, said chambers being disposed alongside one another in axial alignment and being formed in a valve body; a slide valve movable axially within said chambers and substantially comprising a first and a second cylindrical end section having the same diameter and a central cylindrical section of smaller diameter, said end sections having a blind hole therein, and between each of said end sectins and said central section there being formed a first and a second valve element operable respectively to control the opening of a first port between said supply chamber and said utilization chamber, and a second port between said utilization chamber and said discharge chamber; a spring acting on said first end section

of the slide valve and being operable normally to hold said slide valve displaced into its end of stroke position towards the other end of said valve; a control chamber formed in said valve body with a bush having one end thereof to define part of said control chamber into which the end of said second end section of the slide valve projects, said end of said second end section having at least one radial notch therein, said blind hole in said second end section being in communication with said control chamber through said at least one radial notch, said control chamber is in communication with said source of supply through a control duct including a port of predetermined dimensions, said bush being provided with a central passage, said central passage being in communication with said blind hole of said second end section, at least one parallel passge in said bush parallel to said central passage, and an annular groove communicating with said parallel passage and constituting a second discharge duct, said source of supply is exhausted through said second discharge duct having a dischrge opening therein, a valve member in communication with said central passage of said bush, said valve member, when open, permits said central passage to communicate with said at least one parallel passage, said valve member operated by electromagnetic means mounted on said other end of said bush, to vary the size of the opening in said central passage for the purpose of varying the pressure of the fluid in said control chamber in a controlled manner, whereby to control the displacement of said slide valve overcoming the force exerted by said spring.

4,527,593

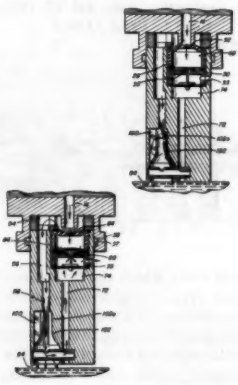
APPARATUS AND SYSTEM FOR FILLING ONE OR MORE CONTAINERS WITH A LIQUID TO A PREDETERMINED LEVEL

Daniel N. Campau, 656 Duxbury Ct., SE., Grand Rapids, Mich. 49506

Filed May 4, 1983, Ser. No. 491,521

Int. Cl.³ F15K *3/04;* F16K *21/18*

U.S. Cl. 137—805 **15 Claims**



1. An apparatus for filling a container with a liquid to a predetermined level comprising:

main valve means for controlling the supply of liquid to the container;

fluid amplifier means for receiving at least a portion of the liquid flowing through said main valve means and for generating a pressure signal in response to the flow of said liquid through the main valve means only until the liquid within said container reaches said predetermined level; and

pilot valve means for maintaining the main valve means open in the presence of said pressure signal and for closing said main valve means in the absence of said pressure signal.

4,527,594

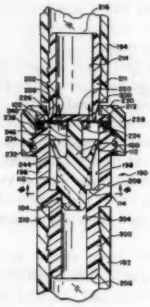
CHECK VALVE

Richard P. Garneau, Davie, Fla., assignor to The AFA Corporation, Hialeah, Fla.

Continuation-in-part of Ser. No. 503,907, Jun. 13, 1983,. This application Apr. 9, 1984, Ser. No. 597,838

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—854 **10 Claims**



1. A check valve for controlling the flow of fluid through a cylindrical passageway having a cylindrical wall surface, said check valve comprising: a housing with a stepped chamber therein, a larger diameter portion of said chamber forming said cylindrical passageway and an annular shoulder being defined at the junction between the larger chamber portion and a smaller-in-cross-section portion; an elongate umbrella valve member having a frusto-conical shaped skirt extending radially outwardly and axially of said valve member, said skirt being positioned to extend in the downstream direction of the flow of fluid through the passageway and in frictional, sealing engagement with the cylindrical wall surface of the passageway but yet being flexible enough to deflect inwardly under fluid pressure to allow fluid to flow past said skirt; and said valve member further including a formation defined by at least two ribs extending radially outwardly and generally opposite of each other, and axially of said valve member and integral therewith, which formation is received in said passageway for seating on said annular shoulder and which has an upstream portion that extends into the smaller-in-cross-section chamber portion.

4,527,595

FLOW REGULATOR

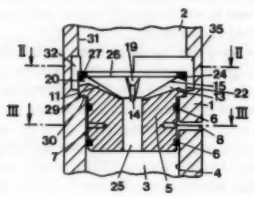
Peter Jorgensen, Havnbjerg; Jens J. Molbaek, Lavensby; Volker Spies, Augustenborg; Poul C. Dyhr-Mikkelsen, Horuphav, and Poul S. Dam, Ketting, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jun. 2, 1983, Ser. No. 500,555

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223206

Int. Cl.³ F15D *1/02*

U.S. Cl. 138—43 **15 Claims**



1. A flow regulator, comprising, a housing having a fluid

inlet section and a fluid outlet section, a generally cylindrically shaped valve body rotatably disposed in said housing between said sections, said valve body having a recessed end face adjacent said inlet section, grooves in said end face of different sizes to provide different flow quantity characteristics and including at least one radially extending groove, said valve body having a central discharge passage communicating with said housing fluid outlet section, fixed control orifices associated with said housing fluid inlet section, groove valve means associated with said grooves and being variably cooperable with said fixed control orifices for different adjusted positions of said valve body for selectively connecting certain ones of said grooves, a disk with an elastically deformable center section and a rigid rim, said disk rim being in engagement with the periphery of said recessed end face, said disk center section being deformable by pressure in said housing fluid inlet section to progressively cover said grooves to increase the throttle resistance thereof.

4,527,596

METHOD AND APPARATUS FOR CLEANING THE REED OF A WEAVING MACHINE

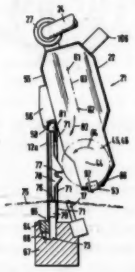
Bruno Kägi, Bubikon, Switzerland, assignor to Maschinenfabrik Sulzer-Rüti AG, Rüti, Switzerland

Filed May 29, 1984, Ser. No. 614,835

Claims priority, application European Pat. Off., Jun. 3, 1983, 83810232.5

Int. Cl.³ D03J *1/00*

U.S. Cl. 139—1 C **17 Claims**



3. An apparatus for cleaning the reed of a weaving machine, comprising:

a cleaning device;

said cleaning device being provided with means for removeably mounting said cleaning device on the reed of the weaving machine while the reed remains in the weaving machine; and

means for translating the cleaning device along the reed during cleaning of such reed.

4,527,597

DOBBY

Kaichiro Yoshida, Kyoto, and Yutaka Ueda, Nara, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Jun. 25, 1982, Ser. No. 392,083

Claims priority, application Japan, Jun. 30, 1981, 56-102664

Int. Cl.³ D03C *1/00, 15/00*

U.S. Cl. 139—68 **5 Claims**

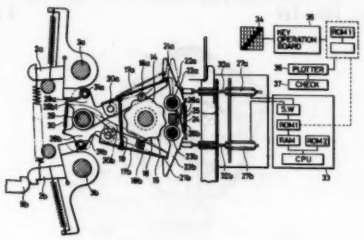
1. A dobby of a weaving loom apparatus comprising:

a heald frame;

a heald frame driving lever adapted to actuate said heald frame;

a retaining hook having operative and non-operative positions, so that when said retaining hook is in said operative position, said retaining hook is engaged with a hook formed on said heald frame driving lever, and when said retaining hook is in said non-operative position, said retaining hook is disengaged from said hook on said heald frame driving lever;

solenoid means for determining said operative and non-operative positions of said retaining hook;



an electronic control device having a switch circuit controlling the energization of said solenoid; and

a weave texture memory element readable by said electronic control device to appropriately operate said switch circuit.

4,527,598

CONTROL APPARATUS FOR A WEAVING MACHINE

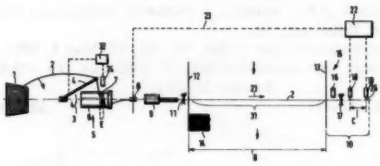
Hansjörg Walch, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 19, 1983, Ser. No. 543,169

Claims priority, application European Pat. Off., Nov. 8, 1982, 82810473.7

Int. Cl.³ D03D *41/00*

U.S. Cl. 139—435 **20 Claims**



1. A weaving machine containing insertion means for a weft thread, comprising:

a weaving shed defining a weft insertion side and a catch side;

a weft-thread brake arranged on said weft side of said weaving shed;

control means operatively connected to said weft-thread brake for controlling said weft thread brake in response to an end of said weft thread which protrudes from said catch side of said weaving shed at the end of the insertion of said weft thread;

means defining a reference value for said end of said weft thread protruding from said catch side of said weaving shed; and

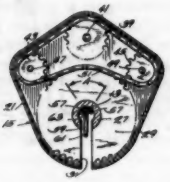
said control means controlling, in response to deviations of said end of said weft thread from said reference value, the actuation of said weft-thread brake such that said end of said weft thread protruding from said catch side of said weaving shed is substantially maintained at a predetermined length set by said reference value defining means.

4,527,599

WIRE TWISTER

Albert L. Clark, West Bend, Wis., assignor to John F. Langkau, Cleveland, Ohio, a part interest

Filed Jan. 4, 1984, Ser. No. 568,047
Int. Cl.[3] B21F *7/00*
U.S. Cl. 140—119 **8 Claims**



1. Portable apparatus for twisting the strands of a multi-strand wire comprising:

(a) housing means;

(b) output sprocket means mounted for continuous rotation within the housing means;

(c) input sprocket means mounted to the housing means for rotation within the housing means;

(d) a chain trained around the input and output sprocket means for transmitting power from the input sprocket means to the output sprocket means; and

(e) a projecting tooth fixedly attached to the output sprocket means and adapted to engage and separate the strands of the wire into two groups,

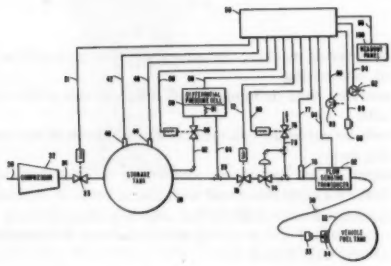
so that rotating the input sprocket means produces continuous rotation of the projecting tooth to twist the two groups of strands about each other, and wherein the housing means includes power means mounted thereto and adapted for continuously rotating the input sprocket means.

4,527,600

COMPRESSED NATURAL GAS DISPENSING SYSTEM

Harry W. Fisher, Pittsburgh, and Emil E. Hrivnak, Monroeville, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 375,065, May 5, 1982, abandoned. This application Mar. 18, 1983, Ser. No. 476,900
Int. Cl.[3] B65B *3/04*
U.S. Cl. 141—4 **28 Claims**



16. The method of dispensing compressed natural gas from a pressurized storage vessel to a receptacle under less pressure than the vessel comprised of the steps of:

(1) connecting said storage vessel and said receptacle with a conduit;

(2) sensing the temperature and pressure of the gas within the vessel before the dispensing cycle is initiated;

(3) initiating the flow of gas through said conduit from said vessel to said receptacle;

(4) sensing the temperature and pressure in said vessel after the flow through said conduit has been terminated;

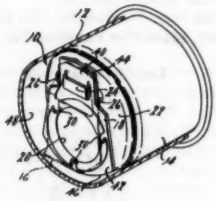
(5) calculating the amount of gas in standard terms discharged from said storage vessel from the initial and final values of pressure and temperature.

4,527,601

FUEL TANK INLET RESTRICTOR

Jerry L. Middleton, West Bloomfield, and Richard H. Bienick, Walled Lake, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 12, 1983, Ser. No. 531,117
Int. Cl.[3] B67C *3/34*
U.S. Cl. 141—348 **3 Claims**



1. A reinforced restrictor assembly for a fuel tank inlet filler tube to prevent the filling of the vehicle fuel tank with a leaded fuel nozzle of a known diameter while permitting filling of the fuel tank with an unleaded fuel nozzle of smaller diameter including reinforcing wall means to prevent any substantial working of the metal forming the restrictor assembly which could be caused by insertion of a pry bar or the like through the fuel receiving aperture and movement of the pry bar back and forth, comprising:

a cup-shaped housing member fabricated from a relatively weak and readily formable material and with a side wall engaging the filler tube adjacent the end thereof remote from the fuel tank;

means of said housing member defining an aperture parallel to the axis of the filler tube including an end wall portion extending across the interior of the filler tube and being integrally attached to the side wall portions of the restrictor assembly which engage the inner walls of the filler tube on a first side of the end wall portion;

closure means carried on said housing member and movable between a normal position subsequently blocking said aperture and a fill position opening said aperture;

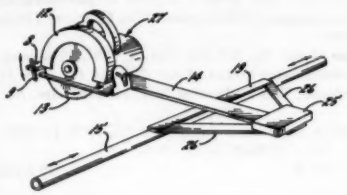
reinforcing wall means extending adjacent to a second side of the end wall portion of the assembly and normally across the interior of the filler tube and having an aperture therethrough cooperating with the end wall to form the fuel receiving aperture of the restrictor assembly;

the reinforcing wall defining edge portions extending closely adjacent to the inner wall surfaces of the filler tube over a substantial circumferential portion of the filler tube and cooperatively engaging the inner wall surface of the filler tube in response to even slight pry bar induced forces on the end wall of the restrictor assembly thereby preventing any substantial working of the end wall portion with respect to the side wall portions of the cup-shaped housing member.

4,527,602
DUPLICATING ATTACHMENT FOR LATHE

Thomas E. Martin, Rte. 15, Box 231, Lexington, N.C. 27292

Filed Jun. 20, 1983, Ser. No. 505,929
Int. Cl.³ B23B *3/28*
U.S. Cl. 142—55 1 Claim



1. A duplicating attachment for conventional turning lathe including means for supporting and rotating a work piece comprising: a support means for holding stationary, a template in a plane parallel to a rotating work piece and located at a position between the lathe operator and the work piece; a cutting means comprising a circular saw blade being rotated by an electric, power driven portable circular saw located above the work piece and being supported by a pivotal mounting located to the rear of the work piece which allows said cutting means to move both laterally and pivotally in contact with the work piece; and said cutting means being fixedly attached and supported on a frame comprised of a laterally sliding cylindrical bar, sliding within a pair of bearing surfaces and which is also permitted to rotate forward or backward to permit movement of the said cutting means in or out of contact with said rotating work piece; said cutting means further having a safety guard shielding the said cutting blade; said safety guard being designed to permit double utility as a handle to pivot and also to laterally guide the said cutting means manually into contact with the work piece in order to shape the work piece; and said cutting means having a displaced counterbalance means to facilitate cutting control; and a lateral cutting means rest comprising a rigid bar extending the full length of the lathe and located below and to the rear of the said cutting means and providing a stop upon which the said counterbalanced cutting means is permitted to rest when not in use, said counterbalance being disposed to the rear of said cutting means and being of sufficient weight to pivot the cutting means away from the work piece when not in use and coming to rest upon said cutting means rest; and

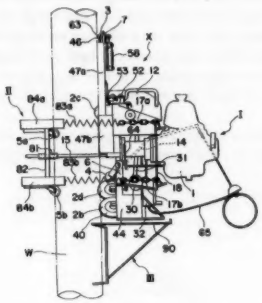
a feeler element attached to the cutting means support which contacts the contour surface of the template to limit the cutting means contact to the said work piece, causing the cutting means to shape the work piece to an exact replica of the template contour as the cutting means is moved along the work piece in conjunction with the movement of the feeler element along the contour of the template.

4,527,603
AUTOMATIC LOPPING MACHINE

Renji Hori, 4-11-10, Nanpeidai, Takatsuki-shi, Osaka-fu, Japan

Filed Mar. 12, 1984, Ser. No. 588,772
Claims priority, application Japan, Mar. 11, 1983, 58-41025
Int. Cl.³ B27L *1/00*
U.S. Cl. 144—2 Z 2 Claims

1. In an automatic lopping machine which comprises a main body including a plurality of drive wheels, each adapted to be driven in a plane inclined a predetermined angle to the trunk of a standing tree having branches to be lopped, and a chain saw extending generally vertically and having a saw chain adapted to be driven in one direction for cutting the tree branches, and an auxiliary unit including a plurality of idle wheels and adapted to be connected together with the main body by means of a spring-loaded connecting means so as to encircle the tree trunk with the drive wheels and the idle wheels contacting the peripheral surface of the tree trunk, said machine during the rotation of the drive wheels revolving helically around the tree trunk so as to ascend the tree trunk while the branches are successively cut from the tree trunk by the chain saw, the improvement which comprises a single drive unit having a drive shaft, a sprocket wheel mounted on the drive

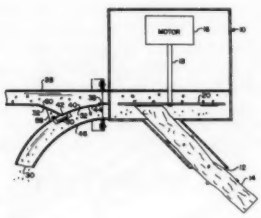


shaft for rotation together therewith and drivingly coupled to the saw chain, a reduction gear unit coupled drivingly to the drive shaft and having an output shaft, and transmission means for drivingly coupling the output shaft to the drive wheels, said saw chain being driven by the drive unit at a high speed and said drive wheels being driven at a reduced speed by the drive unit through the reduction gear unit.

4,527,604
WOOD CHIPPING ASSEMBLY

Colvin K. Everett, 701 Terral Island Rd., Farmerville, La. 71241

Filed Feb. 21, 1984, Ser. No. 581,584
Int. Cl.³ B02C *16/08*
U.S. Cl. 144—176 3 Claims



1. A wood chipping machine comprising:

a housing;

chipping means, positioned within said housing, including a rotatable shaft and cutting blades attached to and rotating about said shaft, for the reduction of a tree trunk into wood chips and residual matter;

an inlet opening in said housing and positioned to enable a tree trunk to be fed into said housing and engage said blades from a first side of said blades;

a first discharge outlet opening in said housing, adjacent to a first region of said housing being on the same side of said blades as said inlet opening, through which residual matter portions of a tree trunk other than wood chips is discharged;

a second discharge outlet adjacent to a second region of said housing, said second region of said housing being on an opposite side of said blades from said first region and wood chips cut by said blades being passed through said

blade and discharged through said second discharge outlet;

a first chute extending from said first discharge outlet, and a second chute extending from said second discharge outlet;

a pivotally mounted plate between said chutes, movable to form, in a first position, a common wall of said first and second chutes, whereby wood chips are discharged through said second discharge outlet, and residual matter is discharged through said first discharge outlet, and said plate being movable to a second position which blocks said first chute and connects said first discharge outlet with said second chute, whereby wood chips and residual matter are both discharged through said second chute; and

latching means secured to said plate for selectively securing said plate in either said first or second positions.

4,527,605

WORKBENCHES

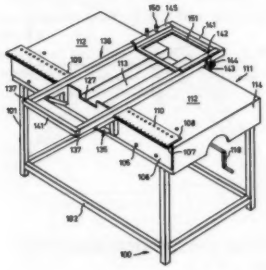
Douglas F. C. Ede, Tunbridge Wells; Brian S. Wilkinson, and Colin B. Mynott, both of Newmarket, all of England, assignors to Newjig Limited, Tunbridge Wells, England

Filed May 10, 1983, Ser. No. 493,255

Claims priority, application United Kingdom, Dec. 13, 1982, 8235487

Int. Cl.³ B25H *1/04*

U.S. Cl. 144—286 R **5 Claims**



1. A bench comprising a frame, a substantially horizontal working surface mounted on said frame, a fence secured to the frame and defining a substantially straight edge adjacent the rear side of the working surface, a ledge mounted to said fence and extending over a portion of the working surface, a bride secured to the frame and including forwardly extending guides which extend accurately perpendicular to the straight edge defined by the fence, a carriage slidable along said guides and adapted to carry a power tool, the fence, the ledge and the bridge being secured to the frame in a rigid manner and means to cause the working surface to be raised and lowered relative to the frame, and thus relative to the fence, the bridge and the ledge, so that a workpiece on the working surface may be releasably clamped between the ledge and the working surface.

4,527,606

PNEUMATIC RADIAL TIRES FOR PASSENGER CARS HAVING LOW ROLLING RESISTANCE AND EXCELLENT SLIPPING RESISTANCE

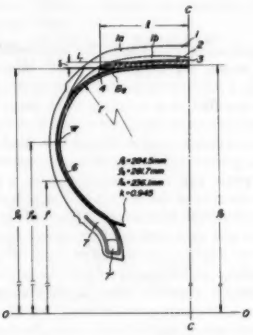
Toshio Kita; Nobumasa Ikeda, both of Kodaira; Takashi Takusagawa, Ohme; Yoshiharu Goto, Kodaira; Hiroshi Hayakawa, Tokyo, and Minoru Togashi, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 310,253, Oct. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 114,172, Jan. 22, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 550,733

Claims priority, application Japan, Jan. 24, 1979, 54-5998

Int. Cl.³ B60C *9/20, 11/00, 1/00*

U.S. Cl. 152—209 R **10 Claims**



1. A pneumatic radial tire for passenger cars having a low rolling resistance and an excellent wet skid resistance comprising, a carcass of a radial construction composed of a rubberized ply of cords and toroidally extending between a pair of circular bead cores with the ends turned thereover, a tread portion arranged outside a crown portion of said carcass and having a two laminate structure composed of a tread base rubber and a tread cap rubber, and a reinforcing belt layer embedded in said tread base rubber and superimposed about said crown portion of said carcass, said tread base rubber having a resilience of not less than 65%, said tread cap rubber having a resilience of not more than 60%, said tread portion having a sectional ratio of a sectional area Sc of said tread cap rubber occupied in the equatorial section of the tire to a total sectional area S of said tread portion of not less than 50% and a negative ratio of not more than 45%, and said belt layer having a flatness of not more than 15%.

4,527,607

TIRE TOOL

Dolphard Gaither, Rt. 1, Box 43, Cameron, Okla. 74932

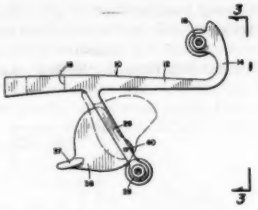
Filed Sep. 30, 1982, Ser. No. 428,643

Int. Cl.³ B60C *25/04*

U.S. Cl. 157—1.3 **10 Claims**

1. A tire tool for removal of a tire from a wheel rim, said tire tool comprising a main body portion having a bore provided in the proximity of one end thereof, an arcuate flange provided at the opposite end thereof, first roller means journalled at; the outer end of the arcuate flange, an arm member extending outwardly from one face of the main body portion and in a direction opposite the arcuate flange, second roller means journalled at the outer end of the arm member, bumper means provided on the tire tool for facilitating the release of the tire from the wheel rim during a tire removal operation, the bumper means being secured to the arm member, and wherein the

bumper means comprises a plate member pivotally secured to the arm member, and stop means provided on the plate member for engagement with the arm member to limit the pivotal movement of the plate member in one direction.

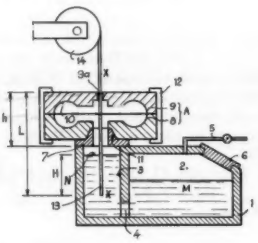


4,527,608

METHOD FOR INOCULATING LIQUID METAL CAST UNDER LOW PRESSURE

Claude Bak; Rio Bellocci, both of Pont a Mousson, and Serge Colmet, Fumel, all of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed May 23, 1984, Ser. No. 613,117
Claims priority, application France, May 30, 1983, 83 08942
Int. Cl.³ B22D *27/20, 27/14*
U.S. Cl. 164—58.1 **7 Claims**



1. A method for inoculating liquid metal (M) in a low pressure, uphill casting apparatus including a casting ladle (**1**), means (**5**) for applying gas pressure to the ladle, a vertical casting shaft (**3**) in communication with the ladle for receiving liquid metal therefrom, and a mold (A) disposed above the ladle, tightly mounted to an upper end of the shaft, and defining an interior cavity (**10**) having a lower charging hole (**11**) in communication with a nozzle (**7**) of the shaft, comprising the steps of:

(a) suspending a soluble inoculation wire (**13**) downwardly through the cavity and axially into the shaft such that a lower end of the wire lies just above a first level (N) of liquid metal in the shaft,

(b) raising the gas pressure in the ladle to attendantly raise the liquid metal in the shaft to a second level (N_1) at which a predetermined length (H) of the wire is submerged,

(c) maintaining the gas pressure and the second level for a predetermined time (ab) sufficient to dissolve substantially all of the submerged wire, and

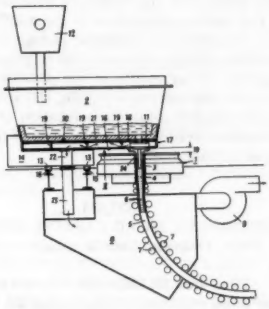
(d) immediately thereafter, further raising the gas pressure in the ladle to attendantly force the thus inoculated liquid metal in the shaft up through the nozzle and charging hole and into the mold cavity to fill said cavity.

4,527,609

CONTINUOUS CASTING PLANT FOR CONTINUOUSLY CASTING A METAL MELT

Thomas J. Nugent, Stamford, Conn., assignor to Voest-Alpine International Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,207
Int. Cl.³ B22D *11/10, 11/14*
U.S. Cl. 164—253 **6 Claims**



1. In a plant for continuously casting a metal, in particular steel, comprising

an open-ended mold defining a mold cavity;

a tundish arranged above the open-ended mold;

an emission collecting means provided above said mold at a distance therefrom and covering said mold cavity so as to suck off emissions emerging from said mold cavity;

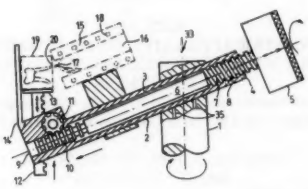
an exhaust duct connected to said emission collecting means and including an exhaust duct stage following upon said emission collecting means and being provided on the lower side of said tundish together with said emission collecting means.

4,527,610

CENTRIFUGAL CASTING MACHINE WITH MEANS FOR BALANCING BY INTERCONNECTION OF BALANCING MASS AND MUFFLER HOLDER

Werner Krebser, Im Haller 17, 8424 Embrach, Switzerland, and Karl H. Schmidt, Binzastrasse 531, 9493 Mauren, Liechtenstein

Filed Sep. 27, 1983, Ser. No. 536,381
Claims priority, application Switzerland, Sep. 29, 1982, 5721/82
Int. Cl.³ B22D *13/00, 13/04*
U.S. Cl. 164—287 **5 Claims**



1. A centrifugal casting arrangement for a centrifugal casting machine, especially for dental applications, comprising:

a drive shaft;

a centrifuge arm operatively connected with said drive shaft;

said centrifuge arm having opposed end portions;

a muffle holder;

means for mounting said muffle holder so as to be movable essentially in vertical direction at one end portion of said centrifuge arm;

said mounting means including an essentially vertically disposed rod member;

a balancing mass displaceably mounted at the other end portion of said centrifuge arm for compensating for imbalance during use of different size casting muffles;

a melting crucible having a pouring opening and cooperating with said centrifuge arm for casting molten metal into a muffle mounted at said muffle holder; and

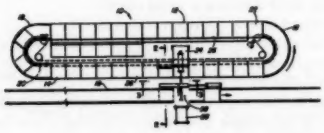
drive connection means for operatively interconnecting said muffle holder and said balancing mass with one another such that during adjustment of the muffle holder to the size of a momentarily mounted casting muffle upon said essentially vertically disposed rod member for accommodating the casting muffle to the position of the casting opening of the melting crucible, the balancing mass is displaced synchronously to a location at the centrifuge arm which serves to balance the mass of the momentarily mounted casting muffle.

4,527,611

PERMANENT MOLD CASTING SYSTEMS

Antony P. Clark, Oakville, Canada, assignor to Cast-Tec Ltd., Canada

Filed Jan. 28, 1983, Ser. No. 461,691
Claims priority, application Canada, Jan. 28, 1982, 395108
Int. Cl.³ B22D *5/04*
U.S. Cl. 164—329 **8 Claims**



1. A permanent mold casting system comprising parallel operating and return rail lines connected at their ends by return loops and having a plurality of mold carriers on said lines; a drive chain for driving said carriers from the end of the operating line and along the return line to the start of the operating line; a mold change and repair track adjacent said return line, and carrier ejecting means for laterally ejecting a mold carrier from the return line onto said change and repair track, and the carrier ejecting means comprises;

(a) means for disengaging a carrier to be ejected from the drive chain;

(b) a shuttle car for supporting said carrier and a section of the return line rails on which said carrier runs; and,

(c) actuating means for moving said carrier and rail sections from the return line to said change track.

4,527,612

ROLL CASTER APPARATUS HAVING NOZZLE TIP ASSEMBLY WITH IMPROVED MOLTEN METAL FLOW CONDITIONS

Ho Yu, Murrysville, and Daniel K. Ai, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 9, 1984, Ser. No. 597,911
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—428 **10 Claims**

1. An improved roll caster tip apparatus capable of providing metal flow therein with a near Hele-Shaw profile comprising:

(a) a molten metal reservoir comprising a bottom plate and at least one sidewall; and

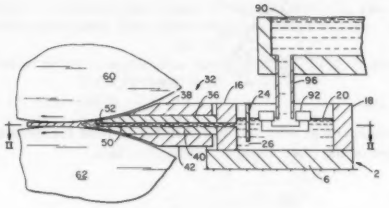
(b) a nozzle tip member attached to said sidewall and terminating in an exit port spaced from said sidewall, said tip member comprising:

(i) a top wall;

(ii) a bottom wall; and

(iii) a pair of side riser members between said top wall and said bottom wall to form a passageway in cooperation with said top and bottom walls; and

(iv) at least one spacer member between said top wall and said bottom wall spaced from said side risers to provide support for said top wall and bottom wall and having a chord length extending from the leading edge of the



spacer facing said reservoir to the trailing edge of said spacer facing said exit port;

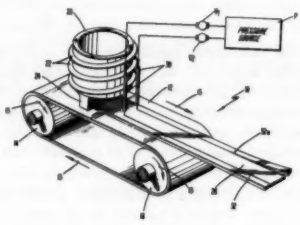
said chord length of said spacer and the distance between said top wall and bottom wall of said nozzle tip being preselected with respect to the velocity and viscosity of the molten metal flowing through said tip to provide at least near Hele-Shaw flow conditions characterized by a reduced Reynolds number of not more than 10.

4,527,613

METHOD AND APPARATUS FOR SLITTING A CONTINUOUSLY CAST METAL RIBBON

John R. Bedell, Madison, N.J., and Eli Rosenthal, Brooklyn, N.Y., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 17, 1983, Ser. No. 506,399
Int. Cl.³ B22D *11/06, 11/12*
U.S. Cl. 164—463 **17 Claims**



1. An apparatus for casting a continuous metal ribbon having a slit along the ribbon length, comprising:

(a) a reservoir for molten metal;

(b) means for dispensing a relatively thin, elongated ribbon from molten metal in the reservoir;

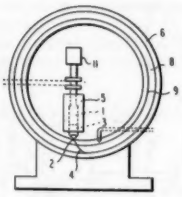
(c) a continuously moving substrate, said substrate including a casting surface for receiving and quenching the dispensed ribbon; and

(d) means adjacent to the dispensing means for generating a controlled disturbance of the ribbon while on said substrate along a defined and localized width to produce a continuous slit line along the ribbon length.

4,527,614
AMORPHOUS CO-BASED METAL FILAMENTS AND PROCESS FOR PRODUCTION OF THE SAME

Tsuyoshi Masumoto; Akihisa Inoue, both of Miyagi; Michiaki Hagiwara, and Kiyomi Yasuhara, both of Kyoto, all of Japan, assignors to Unitika Ltd., Hyogo and Tsuyoshi Masumoto, Miyagi, both of, Japan

Continuation of Ser. No. 311,207, Oct. 14, 1981, abandoned.
This application Apr. 9, 1984, Ser. No. 597,569
Claims priority, application Japan, Oct. 14, 1980, 55-144860
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—463 **2 Claims**



1. A process for producing an amorphous Co-based metal filament having a circular cross-section which comprises

jetting an alloy comprising 20 atomic percent or less of Si, and 7 to 35 atomic percent of B, the total of Si and B being 13 to 40 atomic percent and the remainder being composed substantially of Co, into a rotating member containing therein a cooling liquid through a spinning nozzle having a hole diameter satisfying the equation (III):

$$D_N \leqq 190-8|Si-11|-8|B+0.8Si-25| \quad \text{(III)}$$

wherein D_N is the hole diameter, in μm, of the spinning nozzle, Si is the atomic percent of Si in the alloy, and B is the atomic percent of B in the alloy, to thereby cool-solidify the spun filament, said rotating member being rotated at a circumferential speed equal to or greater than the rate of jetting the molten alloy through the spinning nozzle, and

winding up the filament on the inner walls of the rotating member by the rotary centrifugal force thereof.

4,527,615
ELECTROMAGNETIC WITHIN-MOLD STIRRING METHOD OF HORIZONTAL CONTINUOUS CASTING AND AN APPARATUS THEREFOR

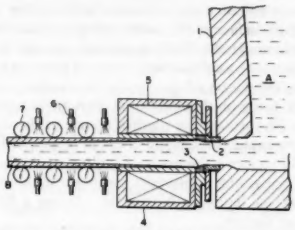
Kiichi Narita, Kobe; Takasuke Mori, Ashiya; Kenzo Ayata, Kobe; Jun Miyazaki, Kobe; Takahiko Fujimoto, Kobe, and Hitoshi Nakata, Toyonaka, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 25, 1983, Ser. No. 469,709
Claims priority, application Japan, Feb. 27, 1982, 57-31510
Int. Cl.³ B22D *11/10, 27/02*
U.S. Cl. 164—468 **4 Claims**

1. An electromagnetic within-mold stirring method used in a horizontal continuous casting apparatus including a tundish, a pouring nozzle, a mold connected to said pouring nozzle, and an electromagnetic coil disposed around said mold, for electromagnetically stirring molten steel passing through said mold by a magnetic field established by said electromagnetic coil, which comprises:

inducing a magnetic field by an alternating current with a frequency f of 1–15 Hz and a maximum magnetic flux density G within the range from $1045 \cdot e^{-0.16f}$ to $2054 \cdot e^{-0.12f}$; and

locating a position where said maximum magnetic flux density is produced within 350 mm from a junction between

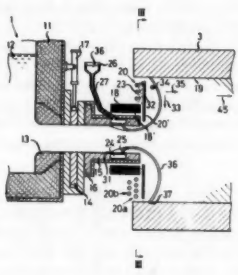


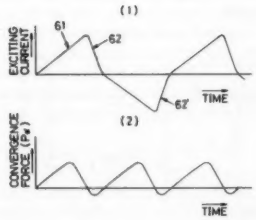
said pouring nozzle and said mold in a direction of drawing a cast-piece.

4,527,616
HORIZONTAL CONTINUOUS CASTING INSTALLATION

Hideo Kaneko; Hatsuyoshi Kumashiro, and Akira Iwata, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 21, 1982, Ser. No. 390,712
Claims priority, application Japan, Jun. 25, 1981, 56-99141
Int. Cl.³ B22D *27/02, 11/10*
U.S. Cl. 164—502 **11 Claims**





1. A horizontal continuous casting installation, particularly for casting a strand of a large transverse dimension, comprising:

a tundish for storing a body of molten metal therein;

a tundish nozzle secured to said tundish in the vicinity of its bottom and extending horizontally therefrom; and

a mold connected to the forward end of said tundish nozzle coaxially therewith for continuously receiving said body of molten metal from said tundish through said tundish nozzle to cast a strand which is continuously withdrawn

therefrom in a horizontal direction, said mold having an inner transverse dimension greater than the inner transverse dimension of said tundish nozzle, wherein the improvement comprises electromagnetic field generating means located between an outer surface of said tundish nozzle and an inner surface of said mold in the vicinity of an end surface of the mold facing said tundish nozzle, said electromagnetic field generating means being disposed adjacent to a substantially vertical plane at a right angle to the center axis of the mold, for exerting an electromagnetic force on the body of molten metal supplied from the tundish through the tundish nozzle to the mold, said electromagnetic force being oriented in a direction toward the mold to move the body of molten metal forwardly.

10. A horizontal continuous casting installation, comprising

a container having a bottom for storing a body of molten metal therein;

a nozzle secured to the container near the bottom and extending substantially horizontally therefrom, said nozzle having a forward end;

a mold situated at the forward end of the nozzle coaxially therewith for continuously receiving the body of molten metal from the container through the nozzle to cast a strand, said mold having a rear end facing the forward end of the nozzle, an inner transverse dimension of the mold being larger than that of the nozzle so that a gap is formed between the forward end of the nozzle and the rear end of the mold, and

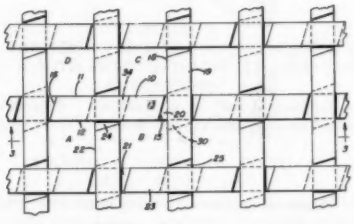
electromagnetic field generating means situated in the gap between the forward end of the nozzle and the rear end of the mold and disposed adjacent to a substantially horizontal plane parallel to the center axis of the mold, said electromagnetic field generating means being energized with an energizing current having an asymmetrical wave form in a plot of absolute current value on a y-axis against time on an x-axis, the absolute value of the slopes of the waves being less on the portions of the waves of increasing absolute current values than on the portions of the waves of decreasing absolute current values, the body of the molten metal in the mold being continuously moved forwardly by said electromagnetic field generating means.

4,527,617

REGENERATOR CHECKER PACKING WITH ENHANCED TRANSVERSE FLOW

Robert Gagne, New Kensington, and Yih-Wan Tsai, Hara Township, Allegheny County, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,056
Int. Cl.³ F28D *17/00*
U.S. Cl. 165—9.4 **11 Claims**



1. A regenerator comprising:

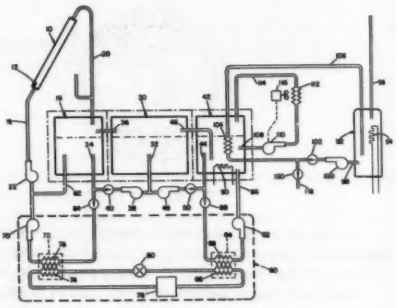
a bed of refractory pieces, a plurality of longitudinally extending flues defined by the refractory pieces and adapted to carry the main gas flow stream through the bed, transverse passageways extending between the flues formed by opposed faces of adjacent refractory pieces, characterized by the transverse passageways each having an opening onto a flue at one end that is larger than the opening onto another flue at the other end, whereby gas is induced to flow through the passageways.

4,527,618

SOLAR ENERGY STORAGE AND DISTRIBUTION SYSTEM WITH HEAT PUMP ASSIST

Donald W. Fyfe, and Franklin S. Hoyt, both of Hollis, N.H., assignors to Solar Decisions, Inc., Hollis, N.H.

Filed Sep. 29, 1982, Ser. No. 427,465
Int. Cl.³ F24D *11/02*
U.S. Cl. 165—18 **23 Claims**



1. A thermal energy storage and transfer system comprising

solar energy collector means disposed to receive incident solar energy,

thermal energy exchange means disposed in a utilization area,

first fluid storage means,

second fluid storage means,

first fluid circulation means to circulate fluid between said solar collector means and said first storage means for transferring thermal energy by mass flow from said collector means to said first fluid storage means,

second fluid circulation means to circulate fluid between said thermal energy exchange means and said second storage means for transferring thermal energy by mass flow from said second fluid storage means to said thermal energy exchange means,

main fluid storage means of larger capacity that either said first or second storage means,

third circulation means to circulate fluid between said main fluid storage means and said first and second storage means for transferring thermal energy by mass flow between said first, second and main fluid storage means,

heat pump means coupled to said first and second storage means for transferring thermal energy between said first and second storage means, said heat pump means including a compressor, an evaporator and a condenser, a cold side fluid circulation loop coupled to one of said fluid storage means, a hot side fluid circulation loop coupled to another of said fluid storage means, cold side heat exchanger means external to said main fluid storage means for transferring heat between said evaporator and said cold side fluid circulation loop, and hot side heat exchange means external to said main fluid storage means for transferring heat between said condenser and said hot side fluid circulation loop, and

control circuitry for operating said system in a plurality of modes including a first mode responsive to a relatively low temperature of fluid in said main fluid storage means in which supplemental energy is applied to said thermal energy exchange means during intervals of the absence of solar energy, a second mode responsive to a relatively high temperature of the fluid in said main fluid storage means in which said third circulation means is operated to

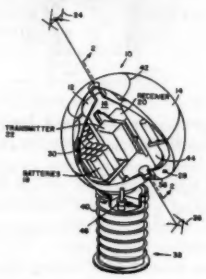
transfer thermal energy by mass flow between said first, second and main fluid storage means; and a third mode responsive to a temperature of the fluid in said main fluid storage means intermediate said relatively low and relatively high temperatures in which said first and second fluid circulation means and said heat pump means are operated concurrently.

4,527,619

EXOATMOSPHERIC CALIBRATION SPHERE

Francis R. Cartier; David N. Stager, both of Manhattan Beach, and Roy M. Acker, Los Angeles, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1984, Ser. No. 635,854
Int. Cl.[3] F64G *1/50*; F28D *15/00*
U.S. Cl. 165—41 **9 Claims**



1. A space-based calibration source including support electronics for medium-wave and long-wave infrared sensors having electronics therein for providing range measurements and surface temperature measurements comprising:

a. a pair of spherical members disposed in substantially concentric, spaced relation to form an annular space therebetween; and

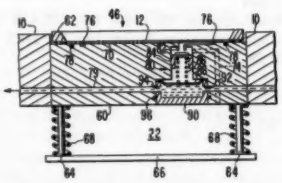
b. heat pipe means disposed in said annular space forming an integral, bi-directional structure for minimizing surface temperature gradients on said calibration source.

4,527,620

APPARATUS FOR CONTROLLING THERMAL TRANSFER IN A CYCLIC VACUUM PROCESSING SYSTEM

Bjorn O. Pedersen, Chelmsford, and Jonathan A. Jost, Rockport, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 2, 1984, Ser. No. 606,052
Int. Cl.[3] F28F *9/00*
U.S. Cl. 165—80 D **22 Claims**



1. In a vacuum processing chamber which is vented during one portion of a cycle and is vacuum pumped to a low pressure during another portion of said cycle, apparatus for providing thermal transfer between a workpiece and a heat sink or source comprising:

a workpiece mounting location including a platen against which said workpiece is sealed to define a thermal transfer region therebetween, said platen including a passage for gas flow between said chamber and said thermal transfer region and a conduit for circulation of a cooling fluid, said mounting location further including fluid-actuated valve means responsive to the pressure of said cooling fluid for controllably opening and closing said passage; and

means for controlling the pressure of said cooling fluid such that said valve means is closed during vacuum pumping when the pressure in said chamber reaches a predetermined intermediate pressure,

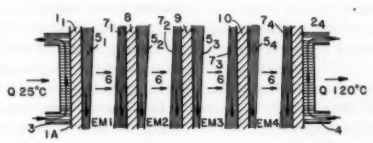
whereby gas at said intermediate pressure is trapped in said thermal transfer region during processing and conducts thermal energy between said workpiece and said platen.

4,527,621

METHOD AND APPARATUS FOR RECYCLING THERMAL ENERGY

Pierre Y. J. Le Goff, Vandoeuvre, France, assignor to Centre National de la Recherche Scientifique, France

Filed Aug. 7, 1981, Ser. No. 291,145
Claims priority, application France, Aug. 11, 1980, 80 17676; Jul. 16, 1981, 81 13846
Int. Cl.[3] F28D *21/00*
U.S. Cl. 165—104.12 **6 Claims**



1. An assembly of evaporator-mixer devices for producing elevated temperatures, each device comprising:

a first wall for conducting heat therethrough;

a first liquid flowing adjacent a first surface of the first wall;

a second liquid flowing across a second surface of the first wall for absorbing heat transferred through the first wall, from the first liquid and causing evaporation of the second liquid;

a second wall located in spaced confronting relation to the first wall;

a third liquid flowing across a surface of the second wall which confronts the first wall and upon which the evaporated second light condenses thereby mixing with the third liquid and elevating the temperature thereof above that of the first liquid; and

a fourth liquid flowing across an opposite surface of the second wall and collecting heat transferred therethrough for elevating the temperature of the fourth liquid to a temperature higher than the first liquid;

wherein a plurality of evaporator-mixer devices are serially cascaded for causing serial energy transfer resulting in progressively increasing temperatures of the liquids at each stage of the cascaded devices.

4,527,622

RING-SHAPED RECUPERATIVE HEAT EXCHANGER

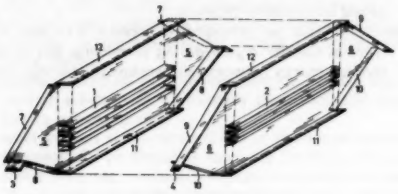
Thomas Weber, Oberursel, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,386

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131091

Int. Cl.³ F28F *3/02*

U.S. Cl. 165—166 3 Claims



1. A ring-shaped recuperative heat exchanger having an inner ring diameter and an outer ring diameter therewith for two gaseous heat exchanging media in a gas turbine system and having a central axis according to direct-/counter-flow principle, said heat exchanger in combination comprising: intermediate plates extending in approximately radial direction from the inner ring diameter to the outer ring diameter of the heat exchanger, wavy guide plates for increasing the heat exchanger surface and arranged between said intermediate plates which are essentially even and extend parallel to the axis of the heat exchanger; when viewed in the circumferential direction, at least every other guide plate being provided with axially parallel surface lines and extending from approximately the inner ring diameter as far as approximately to the outer ring diameter of the heat exchanger, having a wave height which increases as the distance from said central axis increases to form a wedge-shaped heat exchanger element, and forming walls for channels having axial flow therethrough, said guide plates extending parallel to the axis of the heat exchanger and forming the channels located serially in radial direction of the heat exchanger respectively between two said intermediate plates, which channels have the same medium flowing therethrough in axial direction of the heat exchanger, all of said guide plates having axially parallel surface lines, said guide plates respectively cooperating with essentially radially disposed planar intermediate plates to form said channels having axial flow therethrough, the radially inner and outer ends of said intermediate plates being respectively bent at nearly right angles and all extending in the same circumferential direction over and beyond the height of said channels to form U-shaped intermediate plates having legs which rest against the next intermediate plate in a stacked-like manner to close off the radially innermost and outermost channels, the ends of said intermediate plates, when viewed in the axial direction, respectively being provided with triangular end pieces which project axially beyond the axial end faces of said guide plates, with the two free sides of each triangular end piece being respectively bent at right angles in opposite directions, with the corresponding free sides of adjacent intermediate plates being bent in mirror symmetry, with the corresponding free sides of triangular end pieces of adjacent intermediate plates cooperating to form channels which alternately open essentially radially inwardly and outwardly.

4,527,623

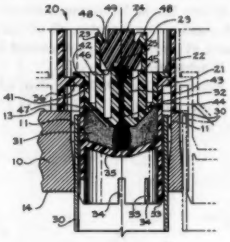
KINETICALLY BONDED TUBES AND TUBESHEET

Richard H. Baird; Theodore J. Blechar; Leo V. B. Giladett, all of Santa Cruz; Reginald M. Horner, Watsonville; Gerald G. Prouty, Santa Cruz, and David L. Rinde, Boulder Creek, all of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 21, 1981, Ser. No. 332,924

Int. Cl.³ B23K *20/08*

U.S. Cl. 165—173 98 Claims



1. An apparatus for bonding an exterior surface portion of a metal tube to a surrounding surface portion of a bore in a metal tubesheet, said bore being separated from an adjacent bore in said tubesheet by a ligament portion of said tubesheet, said ligament portion having a transverse dimension less than a transverse dimension of either bore, said apparatus comprising:

(a) an explosive bonding charge; and

(b) container means housing said bonding charge, said container means functioning to position said bonding charge within said tube inside said bore preponderantly below a front face of said tubesheet, said container means shaping said bonding charge so that an outwardly facing surface of said bonding charge is generally concave, forces resulting from detonation of said bonding charge as shaped and positioned by said container means thereby causing a metallurgical bond to be formed between said exterior surface portion of said tube and said surrounding surface portion of said bore, said bond being strongest adjacent said front face of said tubesheet.

4,527,624

COOLING DEVICE FOR REFRIGERATOR

Susumu Nishida, Katano; Tadashi Fuchigami, Hirakata; Seiji Kimura, Yao; Shunsaku Kishi, Shigino-Nishi, and Akio Kobayashi, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Jun. 18, 1984, Ser. No. 621,430

Claims priority, application Japan, Jun. 20, 1983, 58-111313; Nov. 28, 1983, 58-224788

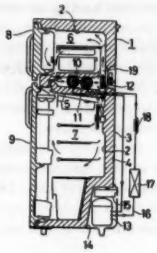
Int. Cl.³ F28F *1/14, 1/36*

U.S. Cl. 165—184 17 Claims

1. A cooling device for use in a refrigerator having a cooled air passageway for flow of air, said cooling device comprising:

a plurality of helically wound thermally conductive metal pipes, the helical axes of said pipes being substantially parallel to each other and generally perpendicular to the direction of air flow through said cooled air passageway, at least one pipe being downstream in the direction of air flow of another pipe in said cooled air passageway;

radial spine fins projecting from the entire surface of each pipe;



each pipe being connected to another pipe through a bent connection portion, to provide a continuous refrigerant passageway.

4,527,625

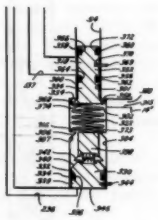
PACKER VALVE ARRANGEMENT

Edward T. Wood, Kingwood, and Ernest O. Sodich, Caldwell, both of Tex., assignors to Completion Tool Company, Houston, Tex.

Continuation of Ser. No. 441,564, Nov. 15, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,886

Int. Cl.³ E21B *33/12*

U.S. Cl. 166—187 **7 Claims**



1. In system for use in packing off a well bore, comprising a tubular mandrel;

an inflatable packing means attached to said mandrel at one end of said mandrel having an interior portion separated from said mandrel and an inlet means to said interior portion;

inflation valve means mounted on the other end of said mandrel having an interior portion separated from said mandrel and having passageway means therethrough, said inflation valve means and said passageway means being in fluid communication with said inlet means to said packing means and to the interior of said packing means and to the interior and exterior of said mandrel;

said passageway means having valve pocket means in said inflation valve means, said valve pocket means being in fluid communication with

the interior of said mandrel,

with the exterior of said mandrel,

with the interior of said packing means, and

with said inlet means to said packing means;

valve means in said valve pocket means including a valve having

a first reciprocating valve member, said first reciprocating valve member having a first seal for sealingly engaging said first reciprocating valve member and the wall of said valve pocket means and being mounted in said valve pocket means with one side in fluid contact with fluid from the interior of the packing element to prevent fluid flow therefrom, said first reciprocating valve member being exposed on the other side of said seal to fluid contact with fluid from the exterior of said mandrel,

first stop means for preventing reciprocation of said first reciprocating valve member prior to the application of at least a predetermined positive differential pressure between fluid in the interior of the packing means and fluid in the exterior of said packing means.

4,527,626

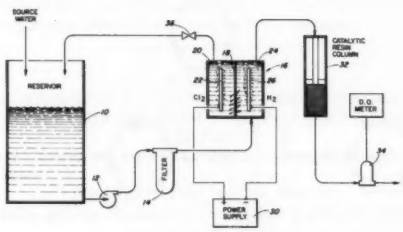
PROCESS AND APPARATUS FOR REMOVING DISSOLVED OXYGEN

Lisa A. Cantu; Marvin E. Yost; Robert L. Coffee, and James E. Stolhand, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed May 7, 1984, Ser. No. 607,914

Int. Cl.³ C25B *1/04, 1/10*

U.S. Cl. 166—275 **9 Claims**



1. A process for removing dissolved oxygen from saline source water comprising the steps of:

filtering the saline source water to remove suspended solids,

electrolyzing the saline source water to evolve hydrogen gas at a cathode of an electrolytic cell, and

conducting the saline source water containing the evolved hydrogen through a bed of deoxygenation catalyst selected from group VIII B metals of the Periodic Table which effects the removal of dissolved oxygen through a catalytic reaction with evolved hydrogen to form water.

4,527,627

METHOD OF ACIDIZING PROPPED FRACTURES

John W. Graham, Alvin, and A. Richard Sinclair, Houston, both of Tex., assignors to Santrol Products, Inc., Houston, Tex.

Filed Jul. 28, 1983, Ser. No. 518,158

Int. Cl.³ E21B *43/267, 43/27*

U.S. Cl. 166—280 **4 Claims**

1. A method for treating a subterranean formation comprising:

hydraulically fracturing said formation to create fractures therein;

filling said fractures with self-consolidating resin coated particles;

curing said resin coated particles to form a cohesive permeable matrix within said fractures; and

acidizing said formation so as to produce channels of increased conductivity adjacent said matrix.

4,527,628

METHOD OF TEMPORARILY PLUGGING PORTIONS OF A SUBTERRANEAN FORMATION USING A DIVERTING AGENT

Walter R. Dill, and Ricky D. Gdanski, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 15, 1983, Ser. No. 523,824
Int. Cl.[3] E21B *43/12*
U.S. Cl. 166—295 **28 Claims**

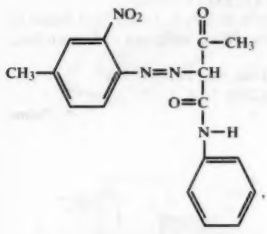
21. A method of diverting an aqueous treating fluid to less permeable portions of a subterranean formation comprising:

contacting said formation with a diverting material comprising

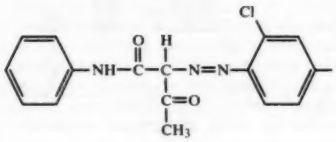
(A) an aqueous carrier liquid; and,

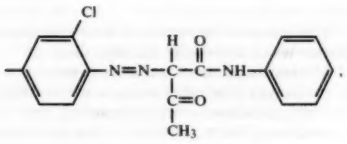
(B) a diverting agent selected from the group consisting of:

I.



II.





and mixtures of I and II.

4,527,629

PRESSURE DIFFERENTIAL CIRCULATING VALVE

Oran D. Whitley, 1506 N. Colpitts, and James B. Poque, Rte. 1, Box 78-A, both of Ft. Stockton, Tex. 79735

Filed Oct. 4, 1982, Ser. No. 432,582
Int. Cl.[3] E21B *34/08*
U.S. Cl. 166—321 **11 Claims**

1. An improved pressure differential circulating valve for flow of fluid there through and out through the pressure differential circulating valve comprising,

a tubular body having means at its ends for connection in and to form a portion of a string of pipe,

the body having a passageway there through communicating with and forming a portion of the string of pipe passageway,

a pair of spaced, facing annular shoulders extending outwardly of the body,

a tubular slide valve slidably disposed about the body between the annular shoulders,

seal means associated with the body and the tubular valve sleeve effective to provide a seal between the body and the tubular slide valve,

an annular valve seat removably disposed about the body and engaging one of the annular shoulders, the valve seat being movable longitudinally and transversely of the tubular body,

the annular valve seat having a valve seating surface,

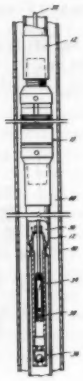
the annular valve seat having an inwardly facing annular groove and a downwardly facing annular groove,

resilient seal means in the grooves engaging the tubular body and the one annular shoulder effective to permit limited transverse and longitudinal movement of the valve seat relative to and to provide a seal between the tubular body and the one annular shoulder,

a mating annular valve surface adjacent one end of the slide valve effective to seat on and form a seal with the valve surface of the annular valve seat, the limited movement of the annular valve seat effective to provide complete alignment of the annular valve seat and the mating annular valve surface,

ports disposed in the body in fluid communication with and closed by the valve surfaces, and

spring means disposed about the tubular body and engaging the other annular shoulder and the other end of the slide valve yieldingly maintaining the slide valve in a position



sealingly seating the annular valve surface of the sleeve valve against the valve surface of the annular valve seat thereby with the seal means closing the ports during normal flow pressures in the passageway in the tubular body but yieldable to predetermined flow pressure higher than the normal flow pressures, whereby

during normal flow through the pipe string passage and the passageway in the tubular body, the slide valve is closed thereby closing the ports, and upon application of flow pressure in the passageways at least as high as the predetermined flow pressure, fluid unseats the annular valve surface of the slide valve from the annular valve surface of the valve seat and forces the slide valve away from the valve seat thereby permitting the flow of fluid from the passageway, through the ports in the tubular body and between the valve seating surfaces and out of the tubular body,

the spring means moving the slide valve to seat its valve surface against the valve surface of the valve seat upon reduction of flow pressure below the predetermined flow pressure thereby sealing the passageway in the tubular body.

4,527,630

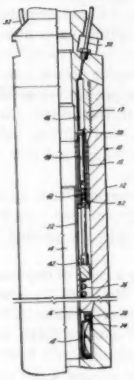
HYDRAULIC ACTUATING MEANS FOR SUBSURFACE SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 383,897, Jun. 1, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 538,000

Int. Cl.³ E21B *43/12*

U.S. Cl. 166—321 **15 Claims**



1. In a well safety valve for controlling the fluid flow through a well conduit and including a housing and a valve closure member moving between open and closed positions, a longitudinal tubular member telescopically movable in the housing for controlling the movement of the valve closure element, the improvement in hydraulic actuating means for actuating the valve closure member comprising,

a cylinder in the housing,

a metal piston movable in the cylinder in response to fluid acting on the piston, said piston connected to and moving the tubular member,

said cylinder on one side of the piston in communication with a hydraulic control fluid passageway, and said cylinder on the second side of the piston in communication with pressure in the safety valve,

said cylinder including first and second spaced metal valve seats, and

first and second metal valve elements connected to the piston, said first and second elements spaced from each other to alternately seat and unseat on the first and second valve seats, respectively, as the piston alternately moves in the cylinder.

4,527,631

SUBSURFACE SAFETY VALVE

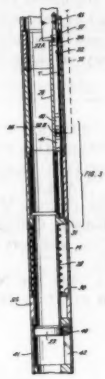
Gonzalo Vazquez, Houston, Tex., assignor to AVA International Corporation, Houston, Tex.

Filed Sep. 12, 1983, Ser. No. 531,413

Int. Cl.³ E21B *34/10, 23/03*

U.S. Cl. 166—322 **5 Claims**

1. For use in a well having a tubing string packed off within a well bore, a subsurface safety valve which comprises a mandrel adapted to be connected as part of the tubing string and having a bore therethrough to form a continuation of the bore through the tubing string, means including operating means for respectively opening and closing the mandrel bore in response to the supply of control fluid thereto or the exhaust of control fluid therefrom, means through which control fluid may be supplied to said operating means from a remote source, a closure member moveable between positions opening and closing the mandrel bore, and means yieldably urging the closure member toward its closed position, said operating means being removable from the mandrel separately of the closure member to permit the closure member to be moved to closed position, and means fluidly disconnecting said bore of



the mandrel above and below the closure member so as to close in the well when said closure member is in closed position and said operating means is removed from the mandrel.

4,527,632

SYSTEM FOR INCREASING THE RECOVERY OF PRODUCT FLUIDS FROM UNDERWATER MARINE DEPOSITS

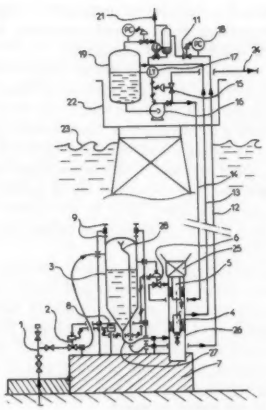
Géard Chaudot, 14, Allee de La Rochefoucauld, 78570 Andresy, France

Filed Jun. 7, 1983, Ser. No. 501,790

Claims priority, application France, Jun. 8, 1982, 82 09976

Int. Cl.³ E21B *43/01*

U.S. Cl. 166—357 **20 Claims**



1. A system for recovering fluids from underwater deposits, said system comprising:

(a) at least one underwater degasification tank, said tank being mounted for buoyancy movement in response to the ratio of gas and fluid product contained by said tank;

(b) a means for connecting the output of a producing well head to said degasification tank;

(c) first pump means for regulating the discharge of product from the tank(s) to the surface;

(d) first control means for said first pump means to regulate

the discharge of said product in response to variations in the gas pressure in said degasification tank;

(e) a valve means for regulating the flow of product from said well head to said degasification tank;

(f) a second control means for regulating said valve means in response to buoyancy movements of said degasification tank.

4,527,633

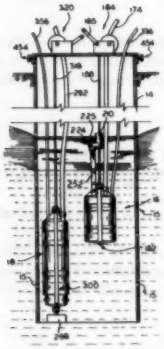
METHODS AND APPARATUS FOR RECOVERY OF HYDROCARBONS FROM UNDERGROUND WATER TABLES

Wayne C. McLaughlin, St. Charles; William J. Recker, Bloomingdale; Phillip C. Modesitt, Chicago, and Paul K. Francescon, Coal Valley, all of Ill., assignors to Pump Engineer Associates, Inc., Addison, Ill.

Filed Jul. 13, 1983, Ser. No. 513,264

Int. Cl.[3] **E21B** *43/12, 44/16;* **F04F** *1/08*

U.S. Cl. 166—370 **12 Claims**



1. Apparatus for recovery of underground liquid petroleum origin hydrocarbons from a well extending below ground surface level, said apparatus comprising:

means for making a draw down of ground water adjacent the well wherein said hydrocarbons in liquid form collect on top of the ground water within the well,

a vessel having a hydrocarbon liquid receiving chamber,

said vessel including a hydrocarbon liquid inflow port adjacent its upper end and hydrocarbon liquid inflow permitting, static pressure responsive check valve means for said inflow port confining flow of the liquid through said inflow port to flow of same in an inflow direction into the vessel chamber,

said vessel including a liquid outflow port disposed adjacent the lower end of said chamber and liquid outflow permitting, static pressure responsive check valve means for confining flow of the hydrocarbon liquid from said chamber through said outflow port to flow of same in an outflow direction out of said chamber and having an outlet adjacent the upper end of said vessel,

a source of gas under pressure,

piping for conveying the hydrocarbon liquid from the well, said source of gas and said piping being located externally of the well and adjacent the ground surface level,

conduit means connecting said gas source to said vessel chamber and including fluid directional flow control valve means located exteriorly of the well including directional control means for venting said chamber to atmosphere therethrough and blocking off said gas source and forming the venting mode of said directional control valve means, and for communicating said gas source to said chamber free of venting of said chamber to the atmosphere and forming the chamber static pressurizing mode of said directional control valve means,

pipe means for connecting said liquid outflow check valve means outlet to said piping with a corresponding liquid head,

means for adjustably suspending said vessel in the well with said inflow port thereof in said hydrocarbon liquid,

and means for stitching said directional flow control valve means between said modes for establishing alternate vessel operation cycles of liquid hydrocarbon inflow to said chamber with venting of said chamber to atmosphere, opening of said vessel inflow valve means under the static pressure of the liquids in the well, and closing of said vessel outflow check valve means under the head of said pipe means, and a gas pressurization of said chamber to evacuate the liquid hydrocarbons therefrom into said piping through said vessel outflow valve means against said head of said pipe means and free of venting of said chamber to atmosphere.

6. The method of recovering from ground water liquid petroleum origin hydrocarbons from a well extending below the ground surface level into the ground water table, said method comprising:

creating and maintaining a cone of depression in the ground water table adjacent the well by removing therefrom ground water and conveying same to the ground surface level and disposing of same remotely from the well site, whereby the underground liquid hydrocarbon adjacent the well collect on the ground water within the well,

disposing within the well and within the liquids therein a closed vessel defining a chamber having drain off open communication with the hydrocarbons to the exclusion of the ground water,

draining into the vessel chamber a quantity of the hydrocarbons from below the top level of same in the well and above the level of the ground water in the well, and venting to atmosphere the air within the vessel displaced by said quantity and thereby establishing a vessel chamber charging step,

sealing the vessel chamber off from the atmosphere and the hydrocarbons that are externally of the vessel and exposing the chamber to a source of compressed air and conducting the quantity of hydrocarbons under the static pressure of the compressed air, and in an isolated flow, to a ground level located recovery line and thereby establishing a vessel chamber discharge step,

and alternately repeating said vessel chamber charging and discharging steps to effect step by step withdrawal of the hydrocarbons within the well free of air and ground water.

4,527,634

EMERGENCY VAPOR POWERED PUMP ASSEMBLY

John T. M. Lee, Phoenixville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 354,223, Mar. 3, 1982, Pat. No. 4,466,489. This application Feb. 16, 1983, Ser. No. 467,086

Int. Cl.[3] **A62C** *27/16*

U.S. Cl. 169—13 **4 Claims**

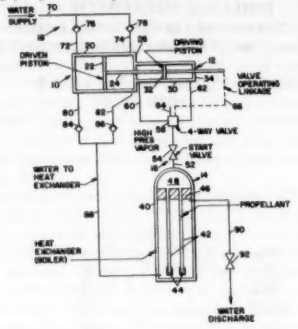
1. An emergency vapor powered pump assembly comprising:

(a) a pump for pumping a liquid from a lower pressure to provide a liquid at a higher pressure;

(b) an engine powered by high pressure vapor driving said pump;

(c) a volatile propellant held in a container means, said container means being in contact with said liquid at higher

pressure to provide heat to said propellant thereby generating propellant vapor; and



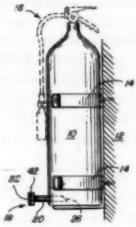
(d) a conduit for conveying said propellant vapor from said container means to said engine to power said engine.

4,527,635

AUTOMATIC FIRE EXTINGUISHING APPARATUS

Richard N. Kirchner, 11204 Gasch Rd., Harvard, Ill. 60033

Filed Nov. 10, 1982, Ser. No. 440,587
Int. Cl.³ A62C *35/02*
U.S. Cl. 169—26 **1 Claim**



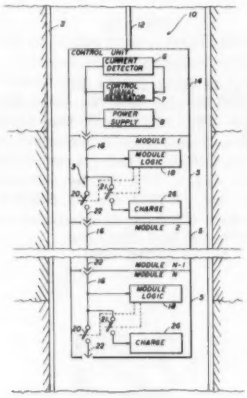
1. An automatic fire extinguishing apparatus comprising:
a portable tank containing pressurized fire extinguishing agent;
means, mounted to said tank, for automatically releasing said fire extinguishing agent,
said automatic release means including a tube extending from said tank,
said automatic release means further including a closed heat fusible element extending across the distal end of said tube in direct contact with at least a portion of said fire extinguishing agent for blocking the flow of said fire extinguishing agent therethrough;
said closed heat fusible element including a flat, rigid inner disc having a central aperture and a flat rigid outer disc large enough to cover said aperture but smaller in diameter than said inner disc;
said inner and outer discs being held together in a sealing face-to-face fashion by a fusible material disposed at their interfacing surfaces which melts at said threshold temperature;
said automatic release means yet further including a sprinkler cap, attached to said distal end of said tube, for distributing said fire extinguishing agent in a pre-determined spray pattern;
said sprinkler cap including an annular shoulder for holding said closed heat fusible element in place across said distal end of said tube;
said sprinkler cap further including a cavity for receiving said fusible element outer disc when it is forced away from said fusible element inner disc;
whereby said outer disc will be forced away from said inner disc and into said cavity by the pressure of said fire extinguishing agent when the temperature of the contiguous environment exceeds said threshold temperature, permitting said fire extinguishing agent to flow through said aperture and out said sprinkler in said pre-determined spray pattern.

4,527,636

SINGLE-WIRE SELECTIVE PERFORATION SYSTEM HAVING FIRING SAFEGUARDS

Ernesto E. Bordon, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 2, 1982, Ser. No. 394,949
Int. Cl.³ E21B *43/116*
U.S. Cl. 175—4.55 **51 Claims**



1. In a single-line selective perforating system having a single firing line for electrically connecting a firing control unit to each of a plurality of shot modules one at a time in a sequence, where each module is adapted for connecting the connected control unit to a next module, a method of selecting a module for firing comprising the steps of:
(a) connecting each module one at a time in the predetermined sequence to the firing line under control of module active time intervals generated internal to the modules, where each module generates its own active time interval in response to being connected to the firing line and where the next module in the sequence is automatically connected to the firing line at the end of the active time for the last connected module;
(b) generating during the active time interval for each module an identification pulse which uniquely identifies the module; and
(c) selecting the module to be selected by generating a selection pulse during the active time of the module to be selected thereby selecting the module for firing and terminating further sequencing of the modules.

27. A single-wire selective perforating system for selectively detonating a plurality of charges comprising:
(a) a control unit operatively connected to the charges by a single firing line which carries both power and control signals between said control unit and the charges; and
(b) a plurality of selectable firing modules vertically connected one to another to form an elongated assembly suitable for lowering into a well borehole, the assembly including said control unit, each module

(i) containing at least one charge and where each module is automatically connected one at a time to the firing line in a predetermined sequence to receive power therefrom, and

(ii) in response to receipt of power on the firing line,

(1) internally generates a module active time interval during which the module and its charge may be selected for firing by said control unit, each module not selected for firing during its active time interval automatically connecting the firing line to the next module in the sequence at the end of the active time interval, and

(2) generates during the active time interval an identification signal which uniquely identifies the module.

4,527,637

CYCLOIDAL DRILL BIT

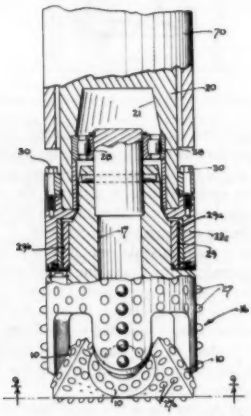
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 262,650, May 11, 1981, Pat. No. 4,403,665, which is a continuation-in-part of Ser. No. 76,194, Sep. 17, 1979, Pat. No. 4,266,619, which is a continuation-in-part of Ser. No. 64,046, Aug. 6, 1979, Pat. No. 4,261,425. This application Jun. 20, 1983, Ser. No. 505,954

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.³ E21B *7/24*

U.S. Cl. 175—55 **13 Claims**



1. In a drill for drilling a bore hole in earthen material, said drill having a drill stem and a drill bit coupled to said drill stem,

orbiting mass oscillator means for generating cycloidal vibratory energy, and

means for coupling the vibratory energy generated by said oscillator to said drill stem, said energy being coupled to said drill stem to generate a cycloidal vibratory force pattern in said stem about the longitudinal axis thereof,

said drill bit having teeth thereon which engage both the side and bottom walls of said bore hole,

the cycloidal vibratory energy being coupled to said drill bit to effect cycloidal precessional motion of the bit around the bore hole simultaneously providing cutting action about both the sides and bottom walls of said bore hole.

4,527,638

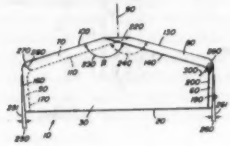
MINE TOOL ROOF BIT INSERT AND A METHOD OF DRILLING THEREWITH

Jaime Sanchez, Newton, and Vinod K. Sarin, Lexington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 25, 1983, Ser. No. 497,959

Int. Cl.³ E21B *17/00*

U.S. Cl. 175—57 **10 Claims**



1. A mine tool roof bit insert of a hard wear-resistant cemented carbide comprising

a flat elongated member having a bottom surface, a first side surface, a second side surface, a first end surface, a second end surface, a first top surface, a second top surface, a central axis, and a maximum diameter; said first side surface being substantially parallel with said second side surface, said first side surface and second side surface being substantially perpendicular to said bottom surface; an intersection of said first side surface and said first top surface forming a first top cutting edge, an intersection of said second side surface and said first top surface forming a first top trailing edge, said first top cutting edge having a first top relief angle from about 22° to about 40°, between said first top cutting edge and said first top trailing edge;

an intersection of said second side surface and said second top surface forming a second top cutting edge, an intersection of said first side surface and said second top surface forming a second top trailing edge, said second top cutting edge having a second top relief angle of from about 22° to about 40°, between said second top cutting edge and said second top trailing edge; an intersection of said first side surface and said first end surface forming a first end cutting edge, an intersection of said second side surface and said first end surface forming a first end trailing edge, said first end cutting edge having a first clearance angle between said first end cutting edge and said first end trailing edge; an intersection of said second side surface and said second end surface forming a second end cutting edge, an intersection of said first side surface and said second end surface forming a second end trailing edge, said second end cutting edge having a second clearance angle between said second end cutting edge and said second end trailing edge;

an intersection of said first top surface and said second top surface forming a top edge; an intersection of said first top cutting edge and said second top trailing edge forming a first top included angle; an intersection of said second top cutting edge and said first top trailing edge forming a second top included angle;

said first end surface and said second end surface angling downward toward said bottom surface forming a taper, said taper having a first included taper angle between said first end surface and said central axis and a second included taper angle between said second end surface and said central axis;

an intersection of said first top surface and said first end surface forming a first rounded corner having a first radius

of curvature said first rounded corner having a point located thereon, said point being located at a first maximum distance from said central axis along a line perpendicular to said central axis, an intersection of said second top surface and said second end surface forming a second rounded corner having a second radius of curvature said second rounded corner having a point located thereon, said point being located at a second maximum distance from said central axis along a line perpendicular to said central axis, said first maximum distance added to said second maximum distance defining a maximum diameter of said insert;

said first radius of curvature and said second radius of curvature being from about D/32 1.375 inches to about $3D/32 \times 1.375$ inches, wherein D is said maximum diameter of said insert; said first side surface, said first end surface, and said first top surface, and corresponding said second side surface, said second end surface, and said second top surface being symmetrical about said central axis; said first radius of curvature, said second radius of curvature, said first top relief angle, and said second top relief of said mine tool bit insert being sufficient to decrease maximum wear and to increase penetration rate of said mine tool roof bit insert by utilizing said mine tool roof bit insert for drilling holes in a mine roof.

4,527,639

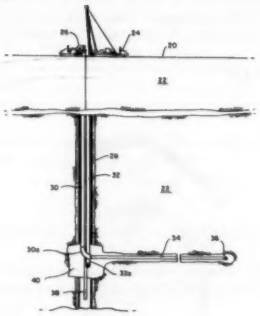
HYDRAULIC PISTON-EFFECT METHOD AND APPARATUS FOR FORMING A BORE HOLE

Ben W. O. Dickinson, III, San Francisco; Robert W. Dickinson, San Rafael, and Stanley O. Hutchison, Bakersfield, all of Calif., assignors to Bechtel National Corp., San Francisco, Calif.

Continuation-in-part of Ser. No. 401,613, Jul. 26, 1982, abandoned. This application Mar. 2, 1983, Ser. No. 471,437

Int. Cl.³ E21B *7/06, 7/18*

U.S. Cl. 175—61 **61 Claims**



1. An apparatus for forming a bore hole in an underground mineral bearing formation, comprising at least one assembly guide means including a guide pipe and piston means movable in the guide pipe, said guide pipe having a forward end and a rearward end and a sealing means therein, said piston means being adapted to move within said guide pipe in fluid sealing engagement with the sealing means, said piston means including an elongate piston body forming a drilling tube having a solid rigid wall and defining an interior fluid passageway, a drillhead of the hydraulic jet type on the forward end of the drilling tube, said sealing means being disposed between the guide pipe and drilling pipe and being mounted to the interior surface of said guide pipe and having fluid sealing engagement with said drilling tube, said guide pipe being in open fluid communication with the rearward side of the drillhead, the drillhead having a fluid pressure area on its rearward side transverse to the fluid passageway capable of receiving fluid pressure so that pressurized hydraulic fluid applied to the guide pipe and from thence into the drilling tube applies pressure against said drillhead rearward side to cause said piston means to move in a forward direction.

36. A method for forming a bore hole in an underground mineral bearing formation, using a drilling system comprising a guide pipe and a rigid drilling tube within the guide pipe, said drilling tube having a drillhead of the hydraulic jet type, said drillhead having a rearward side of its forward end, said method comprising the steps of:

(a) disposing said drilling tube within the guide pipe with the drillhead in communication with the guide pipe, with a seal between the drilling tube and the guide tube;

(b) directing a hydraulic fluid under pressure into the guide pipe and from thence into the drilling tube to cause said fluid to apply force against the drillhead rearward side to move the drillhead and drilling tube forward a sufficient distance into the formation so that the forward portion of the drilling tube projects from the guide tube into the formation and is surrounded by the formation.

4,527,640

WORKING PLATFORM FOR A DRILLING APPARATUS

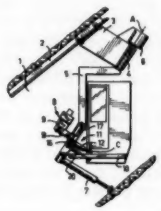
Aimo Sainio, Tampere, Finland, assignor to Oy Tampella Ab, Tampere, Finland

Filed Aug. 30, 1983, Ser. No. 527,792

Claims priority, application Finland, Sep. 16, 1982, 823203

Int. Cl.³ E21B *41/00;* **E21C** *5/00*

U.S. Cl. 175—86 **8 Claims**



1. A working platform for a drilling apparatus for stoping shafts, said drilling apparatus comprising

a base **(3)** displaceable in the direction of the shaft **(1)**,

a supporting arm **(5; 25)** pivotably supported on said base,

a drilling device **(8)** mounted on said supporting arm, and

a working platform **(10)** pivotably mounted with respect to said base,

wherein said working platform **(10)** is fastened to said supporting arm **(5; 25)** by means of an articulated means **(11)** which permits a pivoting of the working platform with respect to the supporting arm around two pivot axes (B, C) perpendicular to each other.

4,527,641

PERCUSSION TOOL

Günter Klemm, Olpe, Fed. Rep. of Germany, assignor to Hydroc Gesteinsbohrtechnik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 355,382, Mar. 8, 1982, abandoned. This application May 1, 1984, Ser. No. 604,434

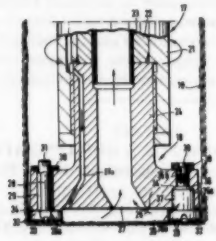
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109367

Int. Cl.³ E21B *11/02;* **E21C** *13/06*

U.S. Cl. 175—92 **19 Claims**

1. A drilling tool comprising a deep hole hammer carried by a drill shaft, said deep hole hammer being operated oy a piston within a housing, said housing being of an outer size and configuration as defined by an outer housing surface, a hammer body having axially opposite front and rear end portions, said rear end portion being adapted to be subject to the blows of said deep hole hammer piston, said rear end portion including

an outer peripheral surface, said front end portion having an outer peripheral surface disposed substantially radially beyond said rear end portion peripheral surface and said outer housing surface and imparting a plate-like configuration to said front end portion, said front end portion further including a rearward facing annular surface merging with said rear end portion outer peripheral surface and a forwardly facing annular surface opposing an associated bore hole bottom; a pair of passage means through said hammer body and opening through said forwardly facing surface respectively introducing a flushing medium through said forward end portion into a bore hole bottom through a first passage means of said pair of passage means and flushing back the drilled material from the bore hole



bottom through said forward end portion through a second passage means of said pair of passage means; said first passage means being disposed generally radially outwardly of said second passage means; a plurality of axial bores opening through said forwardly facing surface and said rearward facing annular surface at positions radially outwardly of said pair of passage means, radially outwardly of said outer housing surface, and radially outwardly of said rear end portion outer peripheral surface; said plurality of axial bores also being spaced circumferentially about said rear end portion outer peripheral surface, a plurality of bore crowns each having a shaft received in an associated one of said axial bores, and each bore crown and front end portion having opposing abutting impact transfer surfaces.

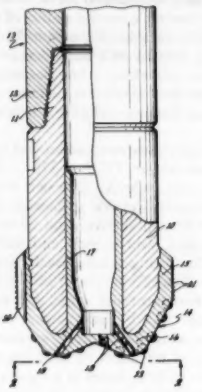
4,527,642

EARTH-BORING DRILL BIT WITH RECTANGULAR NOZZLES

Ruth H. Knowlton, and Hsin Huang, both of Salt Lake City, Utah, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Sep. 21, 1982, Ser. No. 420,794
Int. Cl.[3] E21B *10/46, 10/60*
U.S. Cl. 175—329 **5 Claims**

1. In a bit for drilling earth formations in which the bit includes a metallic shank having a fluid passage, one end of said shank being coated with a hard matrix material bonded to said end and forming a face of said bit, said hard matrix material having a wear resistance greater than that of said metallic shank, a plurality of polycrystalline diamond compact cutters mounted in sockets provided in said matrix and arranged such that the cutters collectively cover substantially the entire area of the bottom of a bore hole in a drilling operation, wherein said cutters include a supporting member and a polycrystalline cutting member so mounted in said matrix that a portion of said support member is beneath said matrix and at least a portion of said polycrystalline cutting member extends beyond the face of said matrix, and wherein said cutters operate to cut by shearing action to produce shavings which must be removed from the region between said face of said matrix and the opposed surface of the formation being cut, the improvement comprising a plurality of nozzles in said matrix face each communicating with said fluid passage for flow of fluid through said nozzles across the face of said matrix, each said nozzle comprising an orifice having a rectangular cross section normal to the axis of said orifice, said rectangular orifices including a height longer than the base thereof and being oriented with the height side extending in a tangential direction to cause the fluid flowing from each nozzle to sweep broadly across the face of the bit,



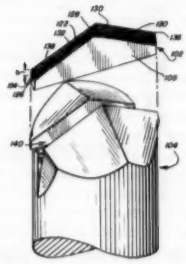
and each of said nozzles being in the face of said bit such that the flow from each nozzle is across the face of said bit and the cutting member of the cutters mounted on said face.

4,527,643

ROTARY CUTTING MEMBER FOR DRILLING HOLES

M. Duane Horton, and L. Brent Horton, both of Provo, Utah, assignors to Megadiamond Industries Inc., Provo, Utah

Filed Feb. 7, 1983, Ser. No. 464,401
Int. Cl.[3] E21B *10/46*
U.S. Cl. 175—329 **15 Claims**



1. A rotary flat drill bit comprising:

a shaft having a central axis; and

a blade member comprising a base portion connected to one end of said shaft and a polycrystalline material portion comprised of randomly oriented crystals which are directly bonded to adjacent crystals, said polycrystalline material portion forming a plurality of cutting edges and extending across said central axis such that said axis divides said polycrystalline material portion into a first part and a second part and during drilling each of said parts is subjected to torsional forces from opposing directions,

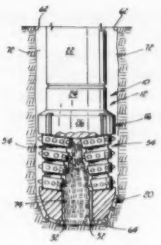
said polycrystalline material portion bonded to said base portion forming a polycrystalline material base interface, said interface being substantially parallel to said torsional forces.

4,527,644

DRILLING BIT

Farouk M. Allam, P.O. Box 5864, Norman, Okla. 73070

Filed Mar. 25, 1983, Ser. No. 479,038
Int. Cl.[3] E21B *10/04*
U.S. Cl. 175—333 **14 Claims**



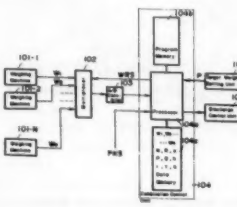
1. A drilling bit comprising:
a drill body comprising:
a base portion;
a crown portion having a plurality of cutting elements supported thereon, the crown portion having an external opening communicating with a core channel; and
a connecting portion, intermediate the base and crown portions, having a core-receiving section communicating with the core channel; and
core milling means, rotatably disposed in the connecting portion and drivable by an external torque applied to the drilling bit, for milling core material within the core-receiving section, the core milling means comprising:
a plurality of rotary members, each rotary member having a rotational axis disposed in oblique relationship to the core-receiving section, each rotary member comprising a right conical frustum characterized by a base surface and a top surface interconnected by a lateral surface, the lateral surface comprising:
an elongate outer edge portion disposable in substantially parallel, adjacent relationship to the side walls of a hole cut by the crown portion of the drill body; and
and elongate inner edge portion transversely extendable within the core-receiving section.

4,527,645

COMBINATORIAL WEIGHING METHOD AND APPARATUS

Takashi Sashiki, Nagaokakyo, and Keiko Sakaeda, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 3, 1984, Ser. No. 596,273
Claims priority, application Japan, Apr. 27, 1983, 58-74829
Int. Cl.[3] G01G *19/22, 13/02*
U.S. Cl. 177—1 **24 Claims**



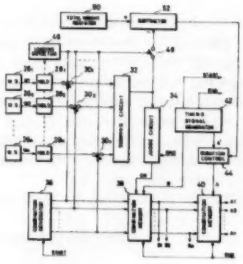
1. A combinatorial weighing method, which uses a combinatorial weighing apparatus having N weighing machines, for weighing out N batches of articles respectively contained by the weighing machines, to a final target weight value P which is greater than the maximum weighing capacity of the combinatorial weighing apparatus, comprising the steps of:
(a) discharging batches of articles from all of the N weighing machines an integral number of times;
(b) discharging batches of articles from a selected at least one of the N weighing machines one time at most;
(c) obtaining a difference value between the final target weight value P and the total weight of the batches of articles discharged in said steps (a) and (b);
(d) performing a combinatorial computation using the difference value as a target weight value Y to select a combination of weighing machines containing batches of articles having a total weight value equal or closest to the target weight value Y within preset allowable limits;
(e) discharging the batches of articles corresponding to the combination of weighing machines selected by the combinatorial computation of said step (d); and
(f) carrying out said steps (a) through (e) so that the total weight value of the batches of articles discharged in said steps (a), (b) and (e) attains a value equal to the final target weight value P or closest to the final target weight value P within preset allowable limits.

4,527,646

COMBINATION WEIGHING MACHINE

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Limited, Hyogo, Japan

Filed Mar. 17, 1983, Ser. No. 476,053
Int. Cl.[3] G01G *19/22, 19/52*
U.S. Cl. 177—25 **10 Claims**



1. A combination weighing machine, comprising a plurality of weighing units for weighing a plurality of articles each and producing weight indicative signals, respectively; combination selecting means for summing said weight indicative signals in accordance with a predetermined set of combinations and electing a combination which provides a sum weight meeting a predetermined qualification; and an automatic feeding device for feeding the articles to said weighing units; wherein said machine further comprises detecting means for detecting the fact that all of said weighing units are producing said weight indicative signals and thereafter causing said weight indicative signals to be supplied to said combination selecting means, said combination selecting means producing a signal indicative of their total weight prior to summing said weight indicative signals in accordance with a predetermined set of combinations; comparing means for comparing said total weight indicative signal with a signal indicative of a predetermined reference weight to produce a signal indicative of the deviation therebetween; and control means for controlling said automatic feeding device in response to said deviation indicative signal to adjust its feeding rate so as to minimize said deviation.

4,527,647

HOPPER AND SUPPORT DEVICE THEREFOR IN AUTOMATIC WEIGHING APPARATUS

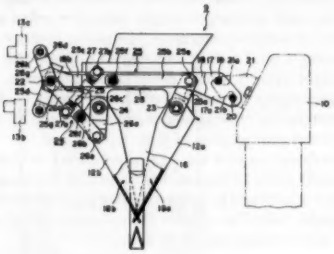
Kenji Ueda, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 30, 1983, Ser. No. 537,669

Claims priority, application Japan, Oct. 1, 1982, 57-149837[U]; Oct. 1, 1982, 57-149838[U]; Oct. 9, 1982, 57-153624[U]

Int. Cl.³ G01G *13/18*

U.S. Cl. 177—105 **5 Claims**



2. An automatic weighing apparatus comprising:

a plurality of weighing machines arranged in a circular pattern;

a plurality of double-wing hoppers arranged in a circular pattern in alignment with respective ones of said weighing machines, each of said double-wing hoppers including a body having a pair of lower article discharge ports and a pair of gates pivotably mounted on said body and independently movable to close and open said article discharge ports; and

a pair of link mechanisms operatively mounted on one outer side surface of each of the bodies of said double-wing hoppers for opening and closing said gates, each link mechanism including—an actuation lever, a drive link fixed to said actuation lever, a follower link mounted on and swingable with a respective one of said gates, an intermediate link interconnecting said drive link and said follower link and a spring connected between said link mechanisms for closing said gate.

3. A hopper body for use in an automatic weighing apparatus, comprising:

a pair of brackets attached to and projecting from the hopper body;

first and second parallel shafts mounted on and between said brackets, said first parallel shaft being closer to said body than said second parallel shaft; and

an attachment member mounted on the automatic weighing apparatus having upwardly opening recesses for receiving said first parallel shaft and downwardly opening recesses for receiving said second parallel shaft.

4,527,648

BATTERY-POWERED WHEELED VEHICLE

Thomas E. Sines, and Yvette L. Chermey, both of 1400 NW. 33rd St., Apt. #38, Pompano Beach, Fla. 33064

Filed Sep. 16, 1983, Ser. No. 532,689

Int. Cl.³ B62D *11/04*

U.S. Cl. 180—6.5 **5 Claims**

1. A vehicle comprising:

a pair of large diameter ground wheels spaced apart laterally;

a rigid frame positioned midway between said wheels;

a single axle for both wheels extending horizontally through said frame;

a driver's seat on said frame above said axle;

a pair of electric motors supported by said frame below said axle;

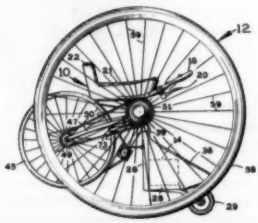
battery means for powering said motors mounted on said frame below said axle;

a pair of speed reduction drives, each operatively connecting a respective motor to a corresponding wheel and each comprising:

a small diameter sprocket on the output shaft of the respective motor;

a larger diameter bicycle wheel rim rotatably supported horizontally behind said frame;

a first endless chain extending around said sprocket and said bicycle wheel rim to impart rotation from the sprocket to the wheel rim;



a small diameter second sprocket coaxial with said bicycle wheel rim and rotatable in unison therewith;

a third sprocket of larger diameter than said second sprocket rotatably mounted on said axle and rigidly connected to the corresponding wheel;

and a second endless chain extending around said second and third sprockets to impart rotation to said wheel;

a caliper brake on each of said bicycle wheel rims for selectively stopping its rotation;

and a pair of brake operating handles located in front of the driver's seat on opposite sides thereof and each operatively coupled to a corresponding caliper brake for selectively applying that brake.

4,527,649

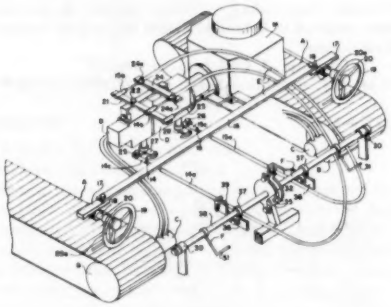
PAVER STEERING APPARATUS

Herbert N. Mauldin, P.O. Box 3992, Greenville, S.C. 29608

Filed Apr. 18, 1983, Ser. No. 486,107

Int. Cl.³ B62D *11/04*

U.S. Cl. 180—6.48 **5 Claims**



1. In a mobile paving apparatus having a hopper, a screed and means delivering asphalt from said hopper to said screed, the improvement comprising:

ground engaging traction means supporting said paving apparatus on each side thereof;

mounting means maintaining said traction means aligned in substantially parallel relation to each other longitudinally of said paving apparatus;

a pair of opposed hydraulic fluid motors, one carried on each side of said paving apparatus, driving said ground engaging traction means on respective sides of said paving apparatus;

a pump supplying fluid to each respective hydraulic motor;

means varying the output of at least one of said pumps varying the fluid supplied the hydraulic motor on one side of said paving apparatus with respect to that supplied to the hydraulic motor on the other side of said paving apparatus;

said means varying the output including steering apparatus, linkage means moved responsive to said steering apparatus, and means moved responsive to said linkage means controlling said pumps; and

advancing and retracting means carrying said means moved responsive to said linkage means for movement with respect thereto;

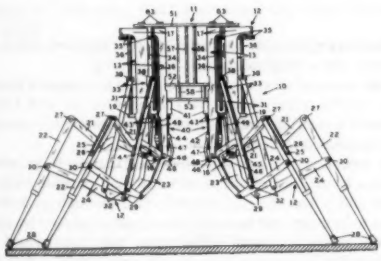
whereby rotation of the ground engaging means on respective sides is controlled in such a way as to cause skidding of one with respect to the other causing turning of the paving apparatus.

4,527,650

WALKING MACHINE

Stephen J. Bartholet, Orange, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Mar. 18, 1983, Ser. No. 476,629
Int. Cl.³ B62D *57/02*
U.S. Cl. 180—8.6 **9 Claims**



1. A walking machine comprising:

a body;

six leg mechanisms coupled to the body and pivotal about six parallel spaced axes, said axes being located at the vertices of a hexagon, each leg mechanism extending beyond the body in a plane parallel to its respective axis, wherein the leg mechanisms can be pivoted so that they extend radially from the center of the hexagon for maximum stability of the walking machine and pivoted so that at least some of the leg mechanisms extend non-radially with respect to the center of the hexagon to provide a reduced profile for the walking machine.

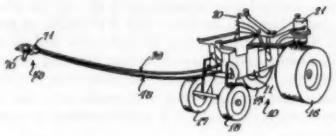
4,527,651

REMOTE CONTROL HANDLE ASSEMBLY

William E. Thiermann, Sr., Glendale, Wis., assignor to Racine Federated Inc., Racine, Wis.

Filed Nov. 17, 1983, Ser. No. 553,742
Int. Cl.³ B62D *51/04*
U.S. Cl. 180—19.2 **10 Claims**

8. A remote control handle assembly for a powered dolly having a pair of control devices comprising, a handle mount remote from said powered dolly, a pair of handles rotatably mounted on said handle mount, one of said handles extending from the side of said handle mount and rotatable about an axis to control the forward-reverse direction of travel of the powered dolly, the other of said handles extending downwardly from said handle mount and rotatable about an axis to control steering of the powered dolly, each of said handles having a shoulder offset from the handle axis of rotation, a first push-pull cable extended between the powered dolly and the handle mount and having a movable inner cable connected between the shoulder of said one handle and one of said control devices whereby handle rotation operates the control device to control



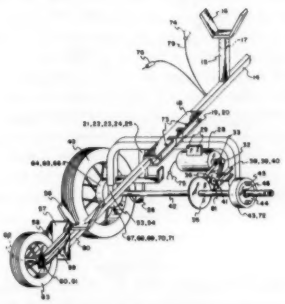
steering, and a second push-pull cable extended between the handle mount and the powered dolly and having a movable inner cable connected between the shoulder of said other handle and the other of said control devices whereby handle rotation operates the other control device to control direction of travel, said handle axes of rotation being perpendicular to each other to have one handle counteract the rotational torque of the other handle.

4,527,652

GOLF CART AND SIMILAR VEHICLES

Hassel J. Savard, Jr., Neshanic, N.J., assignor to Golf-Eze, Inc., Linden, N.J.

Division of Ser. No. 233,042, Feb. 10, 1981, abandoned. This application Jan. 25, 1983, Ser. No. 460,945
Int. Cl.³ B61D *51/04*
U.S. Cl. 180—19.3 **1 Claim**



1. A battery energized, motor driven vehicle for loads such as golf loads and the like, which comprises a tubular frame consisting of an upper stem (**14**) and a lower stem (**80**), a front guiding wheel connected to the end of the lower stem, the tubular frame comprising an inverted U-shaped member (**21**) in the median position thereof and an axle connected (**42**) to said inverted U-shaped member, two side wheels dismountably connected to said axle, clutches connected to said side wheels, at least one load basket (**16**, **56**), dismountably mounted onto said tubular frame, an electric motor carried by said inverted U-shaped member, a battery connectable to said motor and located on one side of said inverted U-shaped member control means for moving and stopping said vehicle and for adjusting the speed, said control means comprising a handle having a free distal end portion adapted to be grasped to move the vehicle and an end portion proximate to the vehicle and in telescopic engagement with said upper stem, said control means comprising a rheostat mounted on said handle, a pinion and a rack, the rack being attached to the lower portion of said

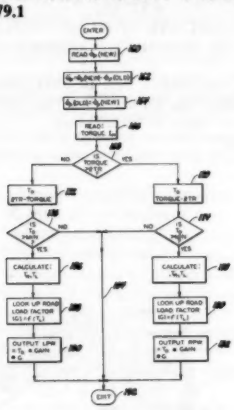
upper stem, said pinion being engageable with said rack, the position of the rheostat changing in the response to the motion of the handle towards the vehicle, the resulting resistance decreasing as the handle is depressed towards the vehicle, whereby the speed of the vehicle increases, said rheostat comprising a dead section, an active section and an insulator portion therebetween the vehicle being idle when the rheostat wiper is located within the dead section, the rheostat wiper contacting the active portion when the vehicle is activated, electric current flowing from said battery and said motor when the cart is activated and wherein each of the clutches comprises an outer hub and an inner hub, a plurality of needles is carried to the inner face of one of said inner and outer hubs, said needles being canted in a direction pointing towards the front wheel, the outer surface of the other hub having a serrated surface, said needles being engageable with said serrated surface whereby rotational force is transmitted in a predetermined direction.

4,527,653

ROAD LOAD INSENSITIVE ELECTRIC POWER STEERING SYSTEM

Paul D. Agarwal, Troy; Roger D. Fruechte, Rochester; Alexander Kade, Detroit, and Thomas A. Radomski, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 23, 1984, Ser. No. 572,874
Int. Cl.³ B64C *13/2, 13/04;* **G06G** *7/66;* **G05B** *13/02*
U.S. Cl. 180—79.1 **2 Claims**



1. For a motor vehicle steering system including a dirigible wheel adapted to be frictionally engaged by a road surface and an operator manipulated steering wheel connected to said dirigible wheel for exerting a steering torque on said dirigible wheel in opposition to the road load torque determined by the frictional engagement between said dirigible wheel and said road surface, apparatus comprising:

power assist means including an electric motor energizable to exert a steering assist torque on said dirigible wheel in accordance with the value of an electrical control signal applied thereto;

control means responsive to the operator exerted steering torque for developing a control signal for energizing said electric motor to produce steering assist torque which aids the operator exerted steering torque; and

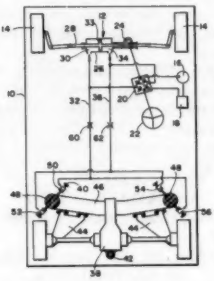
means responsive to the operator exerted steering torque and the resulting steering assist torque produced by said electric motor for developing a road load torque term and for adjusting the value of said control signal in accordance therewith such that the energization of said electric motor is reduced with decreasing road load torque, whereby the relation between the operator exerted steering torque and the resulting rate of steer of said dirigible wheel is substantially insensitive to a reduction in the level of road load torque.

4,527,654

STEERING CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE OR THE LIKE

Yasuji Shibahata; Namio Irie, both of Yokohama; Kazuo Ikawa, Tokorozawa, and Yohsuke Akatsu, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 18, 1983, Ser. No. 476,712
Claims priority, application Japan, Mar. 24, 1982, 57-45505
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—140 **4 Claims**



1. A steering system for a vehicle having a forward wheel, a rear wheel, and a longitudinal axis, comprising:

a power steering servomechanism, including a power steering control valve, operatively connected to said front wheel for steering said front wheel in response to a manually-produced steering signal;

a rear wheel suspension, including an expandable member having a variable volume chamber in fluid communication with said power steering control valve through a conduit so as to be expanded by a pressure signal produced by said power steering control valve when said front wheel is steered for applying a bias to said rear wheel acting to vary the orientation of said rear wheel with respect to said longitudinal axis; and

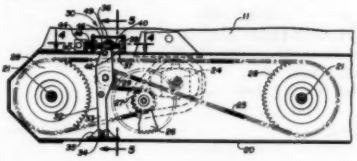
a flow restrictor interposed in said conduit for modifying said pressure signal produced by said power steering control valve.

4,527,655

DRIVE CHAIN ADJUSTER

Charles M. Kline, Reinholds, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 30, 1984, Ser. No. 645,591
Int. Cl.³ B66F *9/00*
U.S. Cl. 180—246 **8 Claims**



1. In a skid steer loader having a main frame; an engine supported by said main frame; a pair of longitudinally spaced

wheels disposed on each side of said main frame; drive means for each pair of wheels to transfer rotational power from said engine to said wheels, said drive means including a chain case, a drive sprocket rotatably mounted in said chain case and being operably associated to said engine to power the rotation thereof, a pair of driven sprockets rotatably mounted in said chain case and associated with the wheels on one side of said main frame, an idler sprocket rotatably mounted on an elongated member pivotally mounted within said chain case to permit a movement of said idler sprocket relative to said drive and driven sprockets, an endless chain entrained around said drive sprocket, said driven sprockets and said idler sprocket to transfer rotational power from said drive sprocket to said driven sprockets; and adjustment means mounted on said chain case in operative association with said idler sprocket to adjust the tension of said endless chain, an improved adjustment means comprising:

a threaded member extending through an opening in said chain case such that a drive portion of said threaded member projects externally of said chain case;

a threaded collar pivotally connected to said elongated member within said chain case and threadably engaged with said threaded member such that manipulation of said drive portion to rotate said threaded member effects a linear movement of said threaded collar along said threaded member to effect movement of said idler sprocket for chain tension adjustment; and

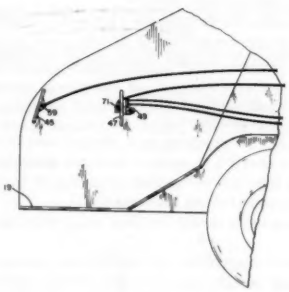
a seal associated with said threaded member to prevent the transfer of fluids through the opening in said chain case.

4,527,656

REFUSE TRUCK CONTROL

Glenn C. Walbridge, 9312 Dawnsford Dr., Fort Wayne, Ind. 46804

Filed May 27, 1983, Ser. No. 498,913
Int. Cl.[3] B60K *26/00*
U.S. Cl. 180—321 **9 Claims**



1. In a rear loading refuse pickup truck of the type having an automatic transmission and a platform near the rear of the truck normally receiving a rider who steps off the platform to load refuse and then steps back onto the platform to be driven by a truck driver to the next refuse pickup site with the rider normally standing on the platform gripping at least one pair of hand holds to maintain his balance, the improvement comprising auxiliary vehicle controls positioned in close proximity to respective hand holds operable from the paltform for undirectional truck operation of limited speeds the auxiliary controls comprising first switch means for controlling the truck transmission between neutral and reverse, second switch means for controlling a steering mechanism of the truck, the second switch means comprising a double-throw switch normally biased to an open position and requiring continuous actuating force to maintain the switch in either closed position, and truck brake actuating means, all said controls positioned in close proximity to respective hand holds enabling the rider to control the truck solely by hand operations in a standing operation while maintaining his hand hold grip.

4,527,657

TAPERED TUBE IMPEDANCE MATCHING UNDERWATER VOICE COMMUNICATOR WITH BUBBLE SILENCER

Philip W. Payne, 157 Cocoa Ave., Indialantic, Fla. 32903

Filed Jul. 31, 1984, Ser. No. 636,327
Int. Cl.[3] G10K *11/00;* **F01N** *7/12*
U.S. Cl. 181—18 **17 Claims**

1. An underwater voice communicator comprising:

means defining an air chamber in communication with a diver's mouth for receiving acoustic energy from the diver's mouth, and

at least one tapered tube connected to and extending from said air chamber means for receiving said acoustic energy from said air chamber, said tapered tube closed at its narrow end and having an inner wall defining a tapered air enclosure when immersed in water, said inner wall causing multiple reflections of said acoustic energy traveling toward said closed end to concentrate said energy at a turnaround area of said tube located toward said closed end, said tapered tube being of resilient material at least at said turnaround area, said concentrated energy acting to expand and contract said resilient material at said turnaround area to thereby transfer said acoustic energy in said tube to said tube wall and, thereby, to the surrounding water.

4,527,658

BUBBLE SILENCER FOR AN UNDERWATER VOICE COMMUNICATOR

Philip W. Payne, 157 Cocoa Ave., Indialantic, Fla. 32903

Filed Jul. 31, 1984, Ser. No. 636,328
Int. Cl.[3] G10K *11/00;* **F01N** *7/12*
U.S. Cl. 181—235 **6 Claims**

1. A bubble silencer comprising:

two opposed walls of flexible material joined at their peripheries to form a flat, flexible enclosure,

an inlet opening at one end of said enclosure for attachment to a scuba regulator valve to allow entrance of high velocity exhaust air bubbles of small size from said regulator valve into said enclosure, and

an outlet opening opposite said inlet opening to expel said exhausted air, said flexible walls acting to coalesce said air bubbles into larger air masses and expel them at low velocity from said enclosure.

4,527,659

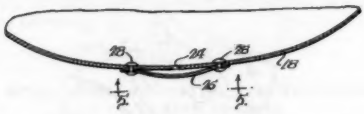
THERMALLY-RESPONSIVE MUFFLER DRAINHOLE VALVE MECHANISM

Daniel L. Harrington, Skokie, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 13, 1984, Ser. No. 579,263

Int. Cl.³ F01N *7/16*

U.S. Cl. 181—244 **4 Claims**



1. A muffler assembly having a thermally-responsive drainhole valve mechanism comprising

a muffler body of metallic material which defines a drainhole through which water within said body can drain, and

valve means operatively associated with said drainhole whereby said valve means closes and opens said drainhole attendant to thermal expansion and contraction of said muffler body,

said valve means comprising a valve member having a coefficient of linear thermal expansion which differs from the coefficient of linear thermal expansion of the material of the portion of said muffler body which defines said drainhole,

said member having a generally elongated configuration with opposite end portion thereof affixed to said muffler body with mechanical fastening means.

4,527,660

POLE CLIMBING AID

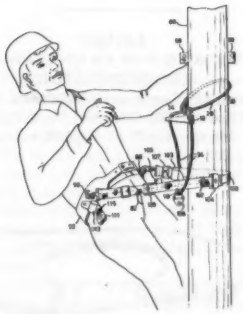
Roman Andruchiw, 137 Spring Garden Ave., Willowdale, Ontario, Canada (M2N 3G6)

Filed Jan. 4, 1984, Ser. No. 568,068

Claims priority, application Canada, Jan. 17, 1983, 491564

Int. Cl.³ A62B *35/00*

U.S. Cl. 182—9 **23 Claims**



1. A hand held pole climbing aid comprising a hand grip member having a blade portion at one end disposed to extend transversely across a pole to be climbed, a handle portion at the other end adapted to be grasped to pivot the hand grip member downwardly about said blade portion, a pair of toothed portions extending downwardly at the ends of said blade portion and adapted to engage the pole upon pivotal movement of the hand grip member, a safety line of relatively stiff but flexible material adapted to form a bight to extend loosely about the pole for holding said hand grip member to the pole, means for removably attaching first and second end portions of said line to the hand grip member to permit the line to form a bight extending therefrom at a predetermined angle which is inclined in an upward direction, said attaching means including adjustable gripping means engageable with the second end portion of the line member to permit movement of said second end portion with respect to the hand grip member for adjusting the size of the bight, said adjustable gripping means being responsive to tension in the safety line for restraining said second end portion.

4,527,661

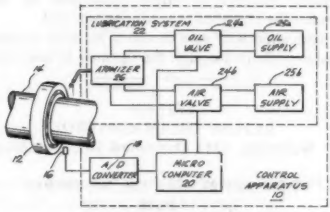
ADAPTIVE CONTROL SYSTEM FOR MACHINE TOOL OR THE LIKE

Richard Johnstone, and Edward E. Kirkham, both of Brookfield, Wis., assignors to Kearney & Trecker Corporation, Milwaukee, Wis.

Filed Oct. 29, 1981, Ser. No. 316,059

Int. Cl.³ F01M *9/00, 11/10;* **G06F** *15/46*

U.S. Cl. 184—6.1 **2 Claims**



1. In a lubricating system for lubricating a mechanism with an air and lubricant mist mixture,

sensing means for mounting in a position to sense the temperature of the mechanism to be lubricated and to continuously produce a signal representing the sensed temperature,

a source of pressurized lubricant,

a source of pressurized air,

an atomizer for applying said mist mixture to said mechanism connected to receive lubricant from said lubricant source from a first line and connected to receive air from said air source from a second line,

a lubricant valve in said first line, an air valve in said second line,

said valves controllable to enable the percent volume of lubricant in said mist mixture to vary over a range of percentages, and

an automatic and continuous control means for controlling the lubricating of the mechanism by determining from said sensing means signal the proper percent volume of lubricant in said mist mixture necessary to maintain said mechanism at a minimum temperature and adjusting said lubricant and air valves to achieve said proper percent volume of lubricant in said mist mixture.

4,527,662

ELEVATOR SPEED CONTROL

John C. Doane, Glastonbury, and Clement A. Skalski, Avon, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 1, 1983, Ser. No. 481,182

Int. Cl.³ B66B *1/30*

U.S. Cl. 187—29 R **3 Claims**

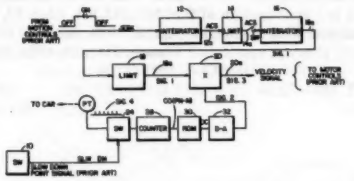
1. An elevator having a car, a motor, a motor speed control

and a car velocity profile generator, characterized in that the car velocity profile generator comprises:

a. a car position sensor that provides a first signal representing change in car position during car motion;

b. means for providing a first analog signal whose magnitude varies at a preselected time rate, said means providing said first analog signal in order to increase motor speed;

c. means responsive to the first signal from the position sensor for providing a digital signal, starting at an approach position to a floor, that represents the desired velocity according to a stored velocity profile, said digital signal having a maximum of unity in response to the initial



application of the first signal and decreasing from unity in response to the change in car position represented by the change in the first signal as the car approaches the floor;

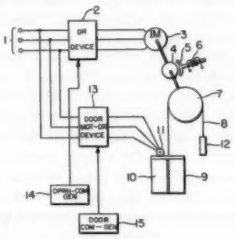
d. means for converting the digital signal into an analog equivalent;

e. means for providing a third analog signal which is the product of the first and second analog signals, so that the magnitude of the third analog signal decreases in proportion to the change in magnitude from unity of the first digital signal as the car approaches a floor, said third analog signal being provided to the motor speed control to control motor speed in proportion to the magnitude of said third analog signal.

4,527,663
APPARATUS FOR CONTROLLING AN AC POWER ELEVATOR

Masami Nomura, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 442,045, Nov. 16, 1982,. This application May 25, 1983, Ser. No. 498,871
Claims priority, application Japan, Nov. 24, 1981, 56-188023
Int. Cl.³ B66B *5/00*
U.S. Cl. 187—29 R **11 Claims**



1. An apparatus for controlling an AC powered elevator comprising:

a three-phase AC power source;

a drive device connected to said three-phase AC power source for converting an AC signal into an AC power having a variable frequency, thereby enabling the controlling of an induction motor;

a winding induction motor connected to and controlled by said drive device for driving the elevator's cage;

a door induction motor connected to and controlled by said drive device for opening and closing a cage door provided at the cage of the elevator;

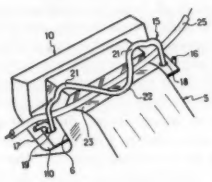
a motor control command device having an operation command generator which generates a command for starting and stopping the cage of the elevator so as to control said drive device and a door command generator which generates a command for opening and closing the cage door so as to control said drive device for independently controlling the winding induction motor and the door induction motor; and

at least one contact connected between said AC power source and said door induction motor for applying a voltage to said door induction motor irrespective of said drive device during the running of said cage for thereby applying a pushing force to said cage door when disposed at its closed position.

4,527,664
DISC BRAKE WITH SLIDING CALIPER AND FRICTION COMPONENT PROVIDED WITH ELECTRICAL WEAR INDICATOR

Claude Le Marchand, Domont, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jan. 31, 1984, Ser. No. 575,617
Claims priority, application France, Feb. 2, 1983, 83 01619
Int. Cl.³ B60T *17/22*
U.S. Cl. 188—1.11 **6 Claims**



1. Disc brake comprising a fixed support defining a central opening delimited peripherally by two arms and in which slide a pair of friction components, and a caliper incorporating at least one brake actuator for operating the friction components, at least one key being interposed between a surface formed internally on the end of one of the arms of the fixed support and a corresponding adjacent surface of the caliper, the key being immobilized axially relative to the end of the arm by an immobilizing component incorporating end portions cooperating in engagement with the axially opposed ends of the key, at least the outer friction component of the brake being provided with an electrical detector for the wear of the lining of this friction component, incorporating a connecting wire conductor, characterized in that the end portions of the immobilizing component are joined by an intermediate portion straddling externally the end of the arm of the fixed support and defining, at least partially, together with the adjacent outside zone of this end of the arm, a channel for the connecting wire conductor to pass through.

4,527,665
PERAMBULATOR BRAKE

Louis Shamie, 630 Avenue V, Brooklyn, N.Y. 11223

Filed Feb. 9, 1983, Ser. No. 465,259
Int. Cl.³ B62B *9/08, 11/00*
U.S. Cl. 188—20 **14 Claims**

1. A braking device for a perambulator having a frame and a wheel with at least one recess therein, the wheel being rotatably mounted to the frame, comprising:

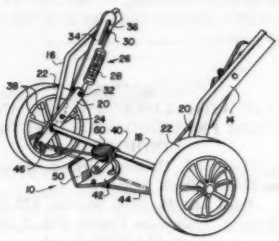
an axle for rotatably mounting the wheel;

stopping means movably mounted on the frame and carried on said axle, said stopping means having a brake rod movable from a locking position in the wheel recess for

blocking rotation of the wheel, to an unlocking position out of the wheel recess for permitting rotation of the wheel;

a suspension plate connected to the frame for rotation about a pivot joint and disposed adjacent the wheel, said suspension plate having an aperture therethrough spaced from said pivot joint for guiding said brake rod for movement between its locking and unlocking positions, said axle being fixed to said guide plate at a location spaced from said pivot joint and from said aperture;

first biasing means connected between said suspension plate and the frame for resiliently suspending said axle and the wheel on the frame; and



locking means connected to said axle for locking said stopping means in at least the locking position of said brake rod, said locking means having an actuator movable in at least one direction for unlocking said stopping means, said brake rod movable in a different direction for movement from its locking into its unlocking position, whereby to move said brake rod into its locking position said actuator must first be moved in one direction and then said brake rod must be moved in a different direction and, with said brake rod in its locking position, the wheel is resiliently held from rotation with respect to the frame over said first biasing means.

4,527,666

RAIL VEHICLE DISC BRAKE ARRANGEMENT

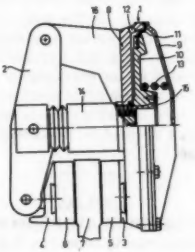
Fred S. Emilsson, Trelleborg, Sweden, assignor to SAB Nife AB, Landskrona, Sweden

Filed Oct. 4, 1983, Ser. No. 538,894

Claims priority, application Sweden, Oct. 5, 1982, 8205665

Int. Cl.³ B61H *13/00*

U.S. Cl. 188—33 **3 Claims**



3. A rail vehicle disc brake system with a disc brake caliper to be suspended from said vehicle to span a vehicle disc to be braked, comprising in combination, a housing, a flat brake cylinder mounted within said housing having a movable piston operable to reciprocatively move the brakes, a first brake pad carried by said housing positioned to engage the disc to be braked, a slack adjuster of the pulling type mounted on said housing coupled to the piston of said cylinder to compensate for brake wear, a bracket extending off said housing above said slack adjuster, a brake lever pivoted at one end to the free end of said bracket, at an intermediate portion, to said slack adjuster, and at its opposite end to a brake pad holder carrying a second brake pad positioned to engage the disc to be braked in complement with said first brake pad, both of which respond to movement of said cylinder.

4,527,667

DISC BRAKE

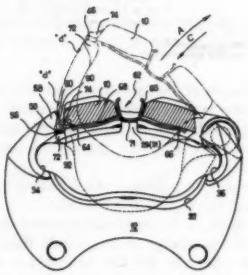
Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 476,693, Mar. 18, 1983, abandoned, which is a continuation of Ser. No. 243,301, Mar. 13, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 588,171

Claims priority, application France, Mar. 18, 1980, 80 05982

Int. Cl.³ F16D *65/09*

U.S. Cl. 188—73.34 **9 Claims**



1. A disc brake having a caliper assembly rotatable relative to a fixed carrier assembly and providing a snap-together engagement of the assemblies to retain the caliper assembly in circumferential alignment with the fixed carrier assembly, comprising a fixed carrier assembly having an opening receiving friction elements and a caliper assembly therein, a rotatable disc adjacent the fixed carrier assembly, the caliper assembly disposed in said opening and in alignment with said friction elements and the disc, resilient means coupled to said caliper and disposed between the caliper assembly and friction elements whereby the resilient means biases the caliper assembly radially outwardly and the friction elements radially inwardly when the caliper assembly is in operative position relative to the carrier assembly, an axial pin connecting the assemblies to provide slidable axial movement of the caliper assembly relative to the fixed carrier assembly, a recessed retention bearing surface disposed on said fixed carrier assembly and extending axially relative thereto, an arcuate surface terminating at the recessed retention bearing surface, and resilient locking element means for providing said snap-together engagement which prevents pivotal movement of the caliper assembly about said axial pin when the caliper assembly is in operative position whereby the friction elements may be moved into engagement with the disc, the resilient locking element means extending substantially axially between said assemblies to permit said axial movement therebetween and fixedly mounted to said caliper assembly to prevent inadvertent separation of the locking element means therefrom when the caliper assembly is pivoted relative to the fixed carrier assembly, the locking element means maintained in a plane parallel to a plane substantially tangent to the outer circumference of the caliper assembly and remaining substantially fixed in an axial direction relative to the caliper assembly while providing for slidable engagement in the axial direction with the fixed carrier assembly, the locking element means including a central axial portion located between said caliper assembly and carrier assembly and for engaging said arcuate surface and to resiliently deform

until the portion rebounds into engagement with said bearing surface, whereby the caliper assembly is pivotable about the pin connection so that said central axial portion engages said arcuate surface and is resiliently deformed thereby to provide a snap-together engagement with said recessed retention bearing surface when said caliper assembly is pivoted into operative position relative to the fixed carrier assembly, the resilient means maintaining the engagement of the resilient locking element means with the retention bearing surface which retains the caliper assembly in said circumferential alignment.

4,527,668

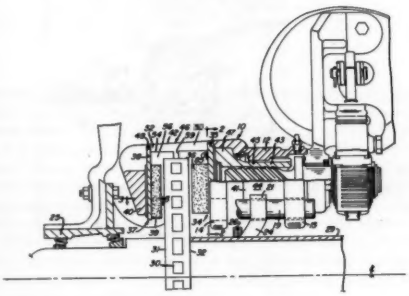
DISC BRAKE FRICTION PAD SUPPORT AND BIASING ASSEMBLY

Donald J. Davidson, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1983, Ser. No. 528,298

Int. Cl.³ F16D *55/224, 65/02*

U.S. Cl. 188—73.38 **3 Claims**



1. A vehicle disc brake comprising a rotor having oppositely disposed friction surfaces secured for rotation with a vehicle wheel, a caliper slidably mounted to a support, said caliper having a leg depending adjacent one friction surface of said rotor, actuating means including a force transmitting plate adjacent the other friction surface of said rotor, reaction abutment means between said actuating means and said caliper, a first friction pad disposed between said force transmitting plate and said rotor, a second friction pad disposed between said depending caliper leg and said rotor, means supporting a radially outer tab of said first friction pad on said caliper, a fastener secured to a threaded bore in said force transmitting plate, said fastener having a shank projecting from said bore through an aperture in said radially outer tab of said first friction pad and terminating in a head, said aperture being greater in diameter than said fastener shank and a spring between said fastener head and said first friction pad biasing said first friction pad toward said force transmitting plate while permitting lateral movement of said first friction pad relative to said force transmitting plate.

4,527,669

FRICTION PAD ASSEMBLIES FOR USE IN DISC BRAKES

Carl Meyer, and Hans G. Madzgalla, both of Koblenz, Fed. Rep. of Germany, assignors to Lucas Industries Limited, Birmingham, England

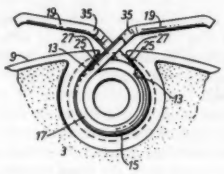
Continuation of Ser. No. 335,444, Dec. 19, 1981, abandoned. This application Apr. 18, 1984, Ser. No. 601,118

Claims priority, application United Kingdom, Jan. 9, 1981, 8100550

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.38 **10 Claims**

1. A friction pad assembly for use in a disc brake comprising a backing plate to which a pad of friction material is secured, a slot centrally located in what is, in use, the upper edge of the backing plate, said slot having a narrow opening having laterally spaced sides and widening out with a curved base wall interconnecting the sides of said opening, an anti-rattle spring having a coiled region comprising a plurality of coils received in said slot and a pair of outwardly extending arms extending



through said opening in generally opposite directions from opposite ends of said coiled region, a portion of each arm being adjacent to a respective side of said opening and including a planar surface engageable with a part of said slot the planar surface of one arm preventing said coiled region from rotating within said slot when a force is applied to the other arm of said spring.

4,527,670

DISC BRAKE

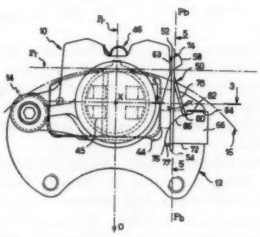
Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 446,073, Dec. 1, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 679,102

Claims priority, application France, Nov. 30, 1981, 81 22348

Int. Cl.³ F16D *65/14*

U.S. Cl. 188—73.44 **3 Claims**



1. A disc brake, comprising a stirrup including a hydraulic brake motor for displacing a friction member to engage frictionally with the rotating disc, the stirrup mounted to slide axially on a fixed support by means of a column extending parallel to the axis of the disc, the column fixed to one of the stirrup and fixed support and slidably received in a corresponding bore in one of the fixed support and stirrup, and locking element associated with the stirrup and fixed support to cooperate in guiding the axial movements of the stirrup relative to the fixed support and to oppose rotational movement of the stirrup about said column when the stirrup is in an operating position so that the hydraulic motor can displace the friction member into frictional engagement with the rotating disc, characterized in that said locking element comprises a releasable, self-locking rod having a pair of oppositely disposed ends providing articulated connections with said stirrup and fixed support by means of joints allowing said rod to move in a plane perpendicular to the plane of the rotating disc, the axes of said joints being perpendicular to a radial plane passing through the axis of the disc and through the axis of said brake motor, a first one of said ends pivotably connected with the stirrup about one of said axes and a second one of said ends pivotably con-

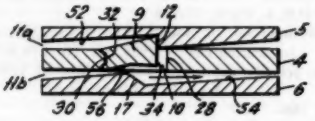
nected with said fixed support about another of said axes, and means for locking the rod when the stirrup is in said operating position by effecting securement of the rod to the stirrup and fixed support, the rod positioned in a plane parallel to a radial plane passing through the axis of the disc in order to prevent said rotational movement of the stirrup, the locking means comprising a blade member integral with said rod and extending from the rod to form an acute angle with the plane of the rod, a free end of said blade member bearing on a stop surface formed on an arm of the fixed support which also is received within an aperture in said second one of said ends, the blade member resiliently deformable to disengage the free end from said stop member and permit release of said rod from said stirrup and fixed support, and the blade resiliently deformable to permit mounting of the rod relative to the stirrup and fixed support so that the blade member freely returns to said angle to engage the stop surface of the fixed support and thereby self-lock the rod into said securement with the stirrup and fixed support when the stirrup is in operating position.

4,527,671

ROTARY DIRECTION REGULATOR FOR SYNCHRONOUS ELECTRIC MOTOR

Osamu Ozaki, Nagoya, Japan, assignor to Sanyei Corporation, Japan

Filed Feb. 27, 1984, Ser. No. 583,883
Int. Cl.³ F16D *63/00*
U.S. Cl. 188—82.74 **17 Claims**



1. A rotary direction regulating device for a rotor of a synchronous electric motor or the like, the regulating device comprising:

a stopper supported eccentrically of the rotor and supported thereto for rotating therewith, whereby the stopper rotates over an annular pathway; the stopper being supported for also being shiftable axially with respect to the rotor while the stopper is being rotated around the axis of the rotor;

cam means located axially next to the stopper and the cam means being supported to prevent rotation of the cam means as the rotor and stopper rotate, the cam means being shaped for engaging the stopper over the annular pathway thereof and being shaped for shifting the stopper axially of the rotor; the cam means being shaped to include a stopper wall inclined with respect to the rotary path of the stopper such that with the stopper moved axially in one axial direction, the stopper engages the stopper wall upon rotation of the rotor and the stopper in one rotary direction; the cam means being further shaped that upon rotation of the rotor and the stopper in the opposite rotary direction, the stopper slides past the stopper wall without abutting the stopper wall and the rotor is thereby permitted by the stopper and the stopper wall to continue rotating in the opposite rotary direction.

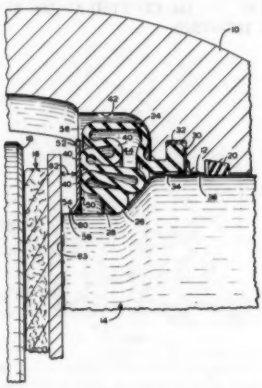
4,527,672

HEAT SHIELD FOR A BRAKE

Peter Schreiner; John R. Wegh, both of South Bend, Ind., and Roger L. Smith, Niles, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 4, 1982, Ser. No. 432,591
Int. Cl.³ F16D *65/78*
U.S. Cl. 188—264 G **1 Claim**

1. A heat shield for a disc brake assembly wherein a piston is movably carried within a caliper housing bore such that movement of the piston during braking in one direction imparts movement to a friction element which is engageable with a rotating member to convert kinetic energy for the rotating member into thermal energy for the friction element, thereby increasing the temperature of the friction element, the heat shield cooperating with the piston to substantially reduce the thermal energy transferred from the friction element to a boot seal engaging the piston, and the piston cooperating with the housing and the friction element to define a cavity for receiving the boot seal and the heat shield, characterized by said heat shield including a first portion extending radially and opposing said boot seal to retain the boot seal in engagement with said piston, said heat shield including a second portion extending angularly relative to said first portion and fixedly engaging said piston, said second portion cooperating with said piston to



maintain said first portion spaced from said friction element and said first portion preventing said boot seal from contacting said friction element whereby the thermal energy for said friction element is dissipated to the spacing between said first portion and said friction element, said second portion defining a gripping edge providing a single line of engagement and engaging an outer surface of said piston to provide the sole means for carrying said heat shield on said piston at a location spaced from said caliper housing and said friction element, said second portion extending angularly from said gripping edge in a direction away from said friction element to define the spacing between said first portion and said friction element so that said heat shield first and second portions are spaced from said friction element and disposed wholly about the exterior of said piston.

4,527,673

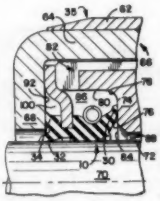
MULTI-PURPOSE FLUID SEAL FOR MOVEMENT CONTROL DAMPERS AND THE LIKE

Peter Szcupak, Park Ridge, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Sep. 16, 1982, Ser. No. 418,945
Int. Cl.³ F16F *9/06, 9/36;* **F16J** *15/32*
U.S. Cl. 188—269 **5 Claims**

1. A fluid seal unit for use in retaining fluids within an associated sealed mechanism having relatively movable parts defining at least one of a pair of fluid-receiving and retaining regions within said mechanism, said seal unit comprising, in combination, a relatively rigid casing unit adapted to be received and retained within a portion of said sealed mechanism, said casing unit having a radially inner bonding portion, and a seal body bonded to said bonding portion of said casing unit and including a primary lip body portion and a secondary lip body portion, with said primary lip body portion lying on the axially inner side of said bonding portion of said casing unit and being

adapted to subdivide the sealed mechanism into radially inner and outer sealed regions and to provide a radially inwardly acting primary seal band around the outer diameter of a reciprocable rod extending through said seal unit, as well as to provide an end face type relief valve seal between said radially inner and outer sealed regions, said primary lip body portion including axially inner and outer frusto-conical surfaces meeting each other along a generally circular locus to define said radially inwardly acting primary seal band, and with said axially inner frusto-conical surface being directed toward and defining a portion of said radially inner sealed region, said primary lip body portion further including a radially outwardly facing contoured surface extending generally axially and including a spring-receiving groove therein, an annular, axially inwardly, radially outwardly tapering marginal surface and a contoured annular end face surface extending between and joining respective axially inner margins of said axially inner frusto-conical primary lip body portion surface and said tapering marginal surface, said tapering marginal surface and said end face surface thereby defining a flexible relief valve body as an integral extension of said primary lip body portion, said secondary lip body portion including at least one surface acting radially inwardly on one of said movable parts to define an excluder seal band thereon.



4,527,674

SHOCK ABSORBER WITH A HYDRO-MECHANICAL STOP

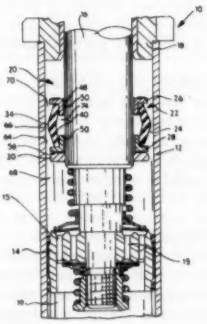
Jack W. Mourray, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01401, § 371 Date Sep. 20, 1982, § 102(e) Date Sep. 20, 1982, PCT Pub. No. WO84/01198, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 20, 1982, Ser. No. 444,247

Int. Cl.³ F16F 9/49

U.S. Cl. 188—284 **5 Claims**



1. In a telescopic shock absorber including a working cylinder, a piston slideably received within said working cylinder and defining a boundary for a rebound chamber within said cylinder, a piston rod connected to said piston and extending through one end of said working cylinder, closure means for closing said one end of said cylinder and slideably mounting said piston rod, the improvement characterized by:

a resiliently flexible ring mounted about said piston rod;

said ring having an annular outer wall with a diameter smaller than the diameter of an inner wall of said working cylinder;

said ring interposed between said closure means and a shoulder fixed to said piston rod such that, at the end of the rebound stroke of said piston rod, said shoulder and said closure means axially compress said ring;

said ring being sufficiently flexible such that, when it is axially compressed, an annular portion of said outer wall enlarges to abut said inner wall of said working cylinder and forming with said cylinder and said closure means a hydraulic chamber; and

restricting means for restricting hydraulic fluid flow from said hydraulic chamber upon further compression of said flexible ring.

4,527,675

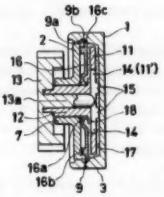
OIL TYPE DAMPER

Nobuaki Omata, Yokohama, and Tsutomu Oshida, Tokyo, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Apr. 19, 1984, Ser. No. 601,899

Int. Cl.³ F16D 57/00

U.S. Cl. 188—290 **2 Claims**



1. An oil type damper, comprising in combination a housing formed of a base and a cap; a rotator formed of a braking disk set in place inside said housing and a hollow shaft extending outwardly from said braking disk and provided with an axial hollow part, said disk being fixed to said hollow shaft, the hollow part of said hollow shaft communicating with the interior of said housing; a flexible membrane mounted around said hollow shaft of said rotator and secured by the circumferential boundary of said membrane to said housing and set in place inside said housing; a toothed wheel adapted to transmit rotational force and having means to secure said toothed wheel to the leading end of said hollow shaft of said rotator extending out of said housing so as to close the outward extremity of the hollow part of said hollow shaft; and oil to fill up the space surrounding said rotator said hollow shaft defining oil passage means permitting said oil to be supplied through said hollow part of said hollow shaft of said rotator after said rotator and said flexible membrane have been set in place inside said housing but before said toothed wheel is secured to said hollow shaft.

4,527,676

VARIABLE-DAMPING-FORCE SHOCK ABSORBER

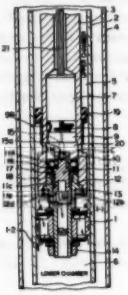
Junichi Emura, Ebina; Issei Kanari, Tokyo, and Hideaki Saito, Atsugi, all of Japan, assignors to Atsugi Motor Parts Co., Ltd., Japan

Filed Jan. 31, 1983, Ser. No. 462,202

Claims priority, application Japan, Feb. 13, 1982, 57-21848[U]; May 31, 1982, 57-80332[U]; May 31, 1982, 57-80333[U]

Int. Cl.³ F16F 9/46

U.S. Cl. 188—299 11 Claims



1. A variable-damping-force shock absorber, which comprises:

(a) a cylinder (2) filled with a working fluid;

(b) a piston rod (3) sealably and reciprocably inserted into said cylinder at one end of said cylinder;

(c) a piston assembly (1) slidably fitted to said cylinder so as to divide the housing of said cylinder into an upper chamber and a lower chamber, said piston assembly being provided with damping-force generating means for restrictively allowing the working fluid to flow between upper and lower chambers divided by said piston assembly when said piston assembly moves to and fro within said cylinder;

(d) a tubular member (12), the lower end of which communicates with the lower chamber, for connecting said piston rod and said piston assembly, said tubular member being provided with a plurality of orifices of different diameters radially formed in the wall thereof at circumferentially spaced equal angular intervals to communicate with the upper chamber;

(e) an orifice adjuster (11) rotatably fitted to said tubular member, said adjuster being provided with an axial bore to communicate with the lower chamber and at least one cutout formed in the wall of the axial bore thereof to selectively communicate with at least one of the orifices formed in said tubular member;

(f) a motor (7) housed within a bored cavity of said piston rod and connected to said orifice adjuster for rotating said orifice adjuster;

(g) means for sensing the angular position of said orifice adjuster in digital fashion, said means being rotated by said motor together with said orifice adjuster; and

(h) means for feedback controlling the revolution angle of said orifice adjuster for communication of the cutout formed in said orifice adjuster with at least one of the orifices formed in said tubular member, said control means being connected to said motor and said orifice adjuster angular position sensing means,

whereby part of the working fluid displaceably passed between the two fluid chambers is adjustably by-passed through the cutout of said orifice adjuster and the orifice of said tubular member in order to vary the damping force of the shock absorber, when said orifice adjuster is controlled by means of said motor housed within said piston rod and said feedback control means in digital fashion.

4,527,677

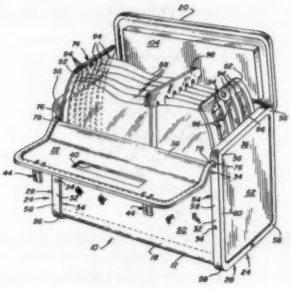
CARRYING CASE WITH REMOVABLE DIVIDER ASSEMBLY

Joseph E. March, and Thomas E. Riley, both of Chicago, Ill., assignors to Platt Luggage, Inc., Chicago, Ill.

Filed Jul. 28, 1983, Ser. No. 518,007

Int. Cl.³ A45C 13/02, 13/04, 13/36; B65D 81/00

U.S. Cl. 190—110 7 Claims



1. A carrying case comprising:

a wall member comprising a bottom wall, first and second sidewalls extending upwardly from opposite sides of said bottom wall, and first and second mutually cooperable lid flaps positioned above said first and second sidewalls respectively and pivotable between open and closed positions, said lid flaps being configured to overlap partially when in closed position so that said first lid flap is partially covered by said second lid flap, said lip flap having a generally rectangular opening formed through it;

a handle which extends through said opening in said second lid flap when said lid flaps are in closed position;

locking means affixed to said lid flaps for securing them in closed position; and

a pair of end assemblies, one fixed to each of the opposite ends of said wall member, each of said end assemblies including:

a generally planar end panel having an interior surface and an exterior surface,

an outer end frame of generally L-shaped cross section extending peripherally about said end panel and having a generally rectangular transverse portion abutting a peripheral portion of said exterior surface and a generally rectangular longitudinal portion extending longitudinally of the case,

a generally U-shaped inner end frame of generally F-shaped cross section having a generally U-shaped longitudinal portion, a first transverse U-shaped flange abutting peripheral bottom and side portions of said interior surface of said end panel, and a second transverse U-shaped flange generally parallel to said first transverse flange and spaced therefrom so that said first and second flanges define therebetween inwardly facing channels along the sides and bottom of said inner end frame,

a plurality of rivets securing end portions of said sidewalls and said bottom wall to said end frames so that said end portions of said side walls and said bottom wall are clamped between said longitudinal portions of said inner and outer end frames, and

a removable divider assembly positioned within the case including first and second generally rectangular end walls and a plurality of longitudinal divider walls extending between said end walls, each of said end walls having

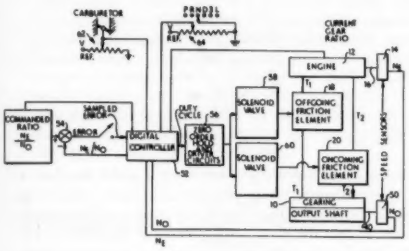
peripheral bottom and side portions slidably mounted within said inwardly facing channels on one of said inner end frames.

4,527,678

TRANSMISSION CLUTCH CONTROL SYSTEM AND METHOD

Stanley L. Pierce, Northville; Larry T. Brown, Westland, and Pramod K. Jain, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1982, Ser. No. 453,415
Int. Cl.³ F16D *21/02, 43/28, 43/30*
U.S. Cl. 192—3.58 **12 Claims**



1. A system for transferring torque from one clutch to another clutch in an automotive automatic transmission during the process of changing from an original gear ratio to another gear ratio comprising:

first and second hydraulically actuated clutches;

a sensor which generates a signal that represents the transmission output shaft speed, NO;

a source of pressurized fluid;

an engine shaft sensor which generates a signal that represents the engine rotational speed, NE;

first and second solenoid-operated actuator valves connected to the pressurized fluid source and to the clutches for pressurizing the clutches from the source and for venting the clutches as the solenoid windings are energized and de-energized;

controller means provided with a data base that includes the values of integral gain, K_i, derivative gain, K_d, proportional gain, K_p, commanded NE/NO ratio corresponding to the gear ratio from which a gear shift is made, and current actual NE/NO ratio, adapted to calculate, to store in memory and to recall from memory the current error, E_c, and previous error, E_p, each error representing the difference between the commanded NE/NO ratio and the actual NE/NO ratio, and for repetitively calculating current duty cycle values, DC_c, for the first clutch solenoid from the relationship:

$$DC_c = DC_p + E_c{*}K_i + (E_c - E_p){*}K_d + K_d + E_c{*}K_p$$

where DC_p is the previous duty cycle for the first clutch solenoid;

the controller means being adapted to produce a duty cycle for the second clutch solenoid that increases its clutch pressure while the first clutch solenoid is controlled in accordance with the current duty cycle value; and

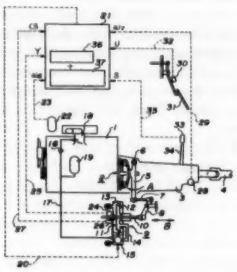
means for converting the current duty cycle of the first clutch and the duty cycle of the second clutch to an electrical current applied to the respective solenoid windings whereby the torque capacity of the first clutch declines and that of the second clutch increases.

4,527,679

ELECTRO-PNEUMATIC CLUTCH CONTROL VALVE

Tooru Hamada, Neyagawa; Hirohisa Tanaka, Tokyo, and Tomoo Ishihara, Takaidonishi, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Aug. 20, 1982, Ser. No. 409,977
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—3.58 **3 Claims**



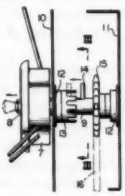
1. A clutch control unit comprising a pneumatic servo-cylinder (**9**), means for operating a clutch as directed by the servo-cylinder, a pneumatic power supply, a proportional electro-pneumatic control valve (**15**) for supplying an air quantity corresponding to an intensity of electric current, an electronic control box (**21**) which controls the above current so as to actuate a clutch in accordance with a given sensed driving patterns previously prescribed on every driving condition, said proportional electro-pneumatic control valve (**15**) having a cylinder (**40**), a vacuum port (**44**) and an atmospheric port (**45**) provided on a circumferential surface of the cylinder (**40**) with a distance kept in the axial direction, a port (**46**) connected to the servo-cylinder (**9**) provided between the ports (**44**) and (**45**), two spools (**41**) and (**42**) of one piece fitted in and sliding freely in the cylinder (**40**), the axial distance between the spools (**41**) and (**42**) being made equal to a distance between the vacuum port (**44**) and the atmospheric port (**45**), the spools (**41**) and (**42**) being elastically pressed from an end of the cylinder (**40**) and can pushed back in the reverse direction by means of an electromagnet from the other end, and the electromagnet (**43**) being supplied with a current from the electronic control box (**21**).

4,527,680

LOCKING DEVICE FOR MOVABLE STORAGE RACK

Yuji Sato, Heim Sunshine A-1302, 28 Renpei-machi, Kumamoto-shi, Kumamoto, Japan

Filed Aug. 5, 1982, Ser. No. 405,408
Claims priority, application Japan, Apr. 10, 1982, 57-060201
Int. Cl.³ F16D *49/00*
U.S. Cl. 192—4 R **18 Claims**



1. An operating and locking device for a movable storage rack of the type having:

a frame mounted on driven wheels;

a manually operated rotatable handwheel; and

a power transmission mechanism by which the rotational power imparted to said manually rotatable handwheel is transmitted to said driven wheels in order to move said movable storage rack; wherein the improvement comprises:

a rotatable pipe shaft, forming part of said power transmission mechanism, fixed to said rotatable handwheel in axial alignment with the axis of rotation thereof and having an axially extending slot in the wall thereof; and

means for locking said power transmission mechanism by preventing rotation of said pipe shaft comprising:

a rod extending inside said pipe shaft along the axis of rotation of said handwheel with one end located in the center of said handwheel and movable forward and backward in the axial direction thereof by means of manual operation from the center of said rotatable handwheel:

a pin toward the other end of said rod extending radially therefrom through said slot in said pipe shaft; and

engaging means fixed to said frame for engaging the end of said pin extending through said slot at one position of the axial movement of said rod to prevent rotation of said pipe shaft with respect to said frame by means of which engagement said power transmission mechanism is obstructed so that it cannot move.

4,527,681

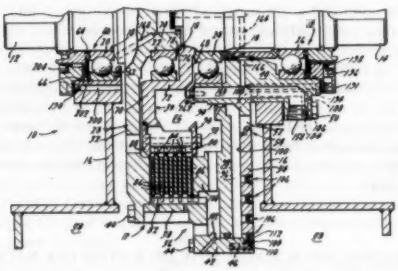
VARIABLE SPEED DRIVE UNIT WITH GRADUATED INCREASING AND DECREASING SPEED PROFILE

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Company, Warren, Mich.

Continuation of Ser. No. 327,716, Dec. 4, 1981, abandoned. This application Jun. 13, 1984, Ser. No. 620,383

Int. Cl.³ F16D *25/061, 25/063, 25/14*

U.S. Cl. 192—52 **16 Claims**



16. An improved variable speed drive unit comprising an external housing, input and output shafts, a fluid reservoir, a rotatable housing secured to one of said shafts, clutch disc stack means including a first series of plates located in said fluid reservoir and supported for rotation by said rotatable housing and a second series of discs interleaved with the plates and supported for rotation with the other of said shafts, having the improvement of:

means for engaging said plates and discs; and

control means for said engaging means including input means having a first position providing fluid flow to said engaging means and a second position providing no fluid flow to said engaging means and output means including a plurality of apertures and having one selected discharge flow rate during operation of said unit, including means for selectively varying said discharge flow rate after the completion of one operation of the unit and before a subsequent operation of the unit, comprising a series of orificed and non-orificed plugs disposeable in said plurality of apertures and interchangeable to provide a variety of ramp actuation profiles as selectively desired during operations of said unit, wherein said plugs are removeable and interchangeable while said engaging means remains intact within said housing.

4,527,682

ADJUSTABLE CLUTCH PEDAL STOP

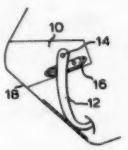
Ronald J. Gale, Hornchurch, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 9, 1983, Ser. No. 560,009

Claims priority, application United Kingdom, Dec. 24, 1982, 8236756

Int. Cl.³ G05G *5/04*

U.S. Cl. 192—99 S **10 Claims**



1. A clutch pedal assembly comprising a pedal bracket, a pedal pivotably mounted on the pedal bracket, and a pedal stop member which in use defines the normal position of the pedal, characterised in that the pedal stop member is movable by the pedal upon initial depression of the pedal to a full travel position but restrained against return movement with the pedal whereby the pedal stop member is adjusted to a position in which it defines a normal position for the pedal having predetermined spatial relationship to the full travel position.

4,527,683

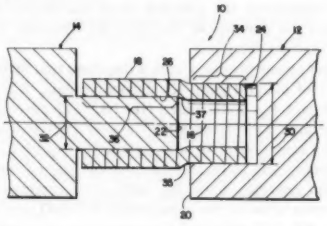
TORQUE LIMITING COIL CLUTCH AND AUTOMATIC SLACK ADJUSTER UTILIZING SAME

George P. Mathews, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 22, 1983, Ser. No. 477,716

Int. Cl.³ F16D *11/00*

U.S. Cl. 192—111 A **6 Claims**



1. An improved two-way torque limiting helical coil clutch connection for drivingly connecting two rotatable members, said connection comprising:

a first rotatable member having an annular interior bore opening to one end thereof;

a second rotatable member generally coaxial with said first member and having and end defining a generally annular periphery adjacent said one end of said first member, and

a single helical coil clutch providing the only driving connection between said first and second members, one end of said coil clutch received in said bore in an interference fit and the other end of said coil clutch received about said outer periphery in an interference fit, said coil clutch wound in a single direction of rotation whereby said coil

clutch will radially expand in one direction of rotation and will radially contract in the other direction of rotation, said coil clutch defining an interior clutch interface with the interior surface of said bore and an exterior clutch interface with said outer periphery, said interior clutch interface having a first maximum torque transfer capacity in said one direction of rotation and a second maximum torque transfer capacity in said other direction of rotation, said first maximum torque transfer capacity exceeding said second maximum torque transfer capacity, said exterior clutch interface having a third maximum torque transfer capacity in said one direction of rotation and a fourth maximum torque transfer capacity in the other direction of rotation, said fourth maximum torque transfer capacity exceeding said third maximum torque transfer capacity, the improvement characterized in that:

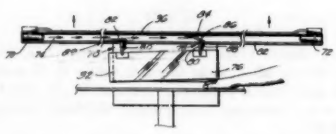
said clutch connection is configured such that in the one direction of rotation said first maximum torque capacity exceeds said third maximum torque transfer capacity and in said other direction of rotation said fourth maximum torque transfer capacity exceeds said second maximum torque transfer capacity whereby for each direction of rotation said connection will limit torque transfer between said members by slipping at the interface for which that direction of rotation is the smaller maximum torque transfer capacity direction of rotation.

4,527,684

RAM SUPPORTED SENSING SHIELD FOR POWER PRESSES

Vincent A. Eggeman; Jerome D. Bubb; Harvey R. Siegel, and Francis H. Wichman, all of Fort Wayne, Ind., assignors to Fort Wayne Truck Parts & Equipment, Inc., Fort Wayne, Ind.

Filed Dec. 20, 1982, Ser. No. 451,199
Int. Cl.[3] B30B *15/12*; F16P *3/14, 3/16*
U.S. Cl. 192—130 **13 Claims**



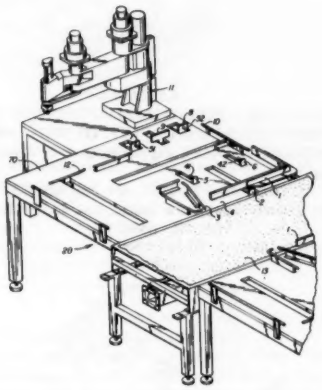
1. In combination with a power press having fixed and movable dies and a reciprocable ram which carries said movable die, means for reciprocating said ram between spaced first and second positions in which said first position is with said dies closed and said second position is with said dies open in work-receiving condition, said movable die in moving from said second position to said first position passing through a "pinch point" position in which said movable die is spaced from but immediately adjacent to said fixed die just prior to closure, sensing means carried by said ram and movable in parallelism with said ram between "pinch point" covering and remote positions for sensing an operator's fingers or hand in the vicinity of said dies when at or near said "pinch point" position and also for guarding against insertion of the operator's fingers of hand into the space of such "pinch point" position, the sensing means including a light source, a photoelectric device, a light path between the light source and photoelectric device, and means movable between a retracted position and a light pathway blocking position with such movement providing the aforementioned sensing of an operator's fingers of hand in the vicinity of the dies, actuating means including a power device interconnecting said ram and said sensing means for moving said sensing means between said "pinch point" covering and remote positions in synchronism with the reciprocating movement of said ram such that said sensing means move in unison with the ram and reaches its "pinch point" covering position substantially simultaneously with said movable die reaching its "pinch point" position and immediately thereafter the actuating means induces relative motion between the sensing means and ram and said sensing means moves to said remote position, stroking means for controlling the reciprocation of said ram and for stopping downward movement of said ram in the direction from said second to said first positions in response to said sensing means sensing the presence of an operator's fingers or hand in proximity to said "pinch point" position of said movable die.

4,527,685

ROBOT ASSEMBLY STATION

William C. Welder, Gilroy, Calif., assignor to Raymond Production Systems Corporation, Hollister, Calif.

Filed Feb. 28, 1983, Ser. No. 470,579
Int. Cl.[3] B65G *47/00*
U.S. Cl. 198—339 **5 Claims**



1. A robot assembly station for use with a programmable distribution system which includes a moving belt for transferring articles between various locations, said robot assembly station comprising:

A. a sweep arm structure comprising:

(1) in plan view, first and second substantially straight arms joined together substantially orthogonally at a vertex,

(2) means holding said arm structure with its vertex alongside but off said belt for permitting rotation of said arm about said vertex, and

(3) means providing rotating power to said arm structure for moving it between a rest position and an article capturing position, said rest position holding said arm structure with said first arm substantially parallel to said belt and the second arm extending away therefrom, said article capturing position being with said first arm extending across said belt to capture an article in an acute angle made by said first arm and the length of said belt, said acute angle being in excess of 45°, whereby an article being carried by the belt is stopped by said first arm and slid by action of the belt therealong toward the second arm, the article being removed from the belt by rotating said arm structure from its arm capturing position to its rest position, thus locating said object in a receiving orientation on an assembly table;

B. an assembly table structure comprising:

(1) a substantially horizontal support surface for supporting said article,

(2) first and second pushers biased normally in a substantially vertical position but being pivotally mounted to rotate in such a manner as to allow the article to slide thereover when said article is being accepted onto the assembly table by said sweep arm structure but which

assume their normally vertical orientations once the article is past,

(3) means for advancing said first pusher to an intermediate position at least to a point beyond said second pusher,

(4) means for advancing said second pusher and thus said article to a final position,

(5) means provided on said second pusher for engaging said article and securing it in its final work position in a relatively rigid, accurately aligned configuration, and

(6) at least one substantially vertical projection arranged to project from the surface of the assembly table and positioned to provide a forward stop to the article, and

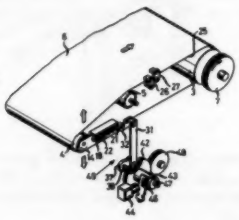
(7) means for pushing the article away from said vertical projections after the article is no longer required to reside at the robot assembly station.

4,527,686

SYSTEM FOR CORRECTING DEFLECTION OF BELT FROM ITS NORMAL PATH OF MOVEMENT

Tsumori Satoh, Yokosuka, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Jan. 21, 1983, Ser. No. 459,795
Claims priority, application Japan, Jan. 21, 1982, 57-6704[U]
Int. Cl.³ B65G *39/16*
U.S. Cl. 198—807 **5 Claims**



1. A system for correcting deflection of a belt from its normal path of movement, wherein a deflection in one direction of the belt trained over a plurality of rollers for movement in a predetermined direction is corrected, at least one of said plurality of rollers being displaceable transversely to its center axis in a manner to allow the moving belt to move rightwardly or leftwardly with respect to the direction of movement of the belt, comprising:

(a) sensor means located along one side edge of said belt for sensing one side edge portion of said belt as it reaches a predetermined leftward or rightward position and producing a corresponding signal;

(b) a movable plate with a shaft means supporting said at least one roller at one end thereof for rotation and being able to move in pivotal movement between one position at which said one roller deflects said belt to one direction of leftward or rightward and another position at which said one roller deflects said belt to the other direction in accordance with said signal;

(c) a cam rotatably mounted to effect pivotal movement of said movable plate; and

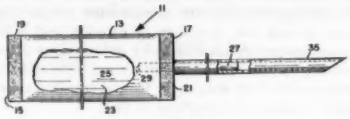
(d) a spring clutch connecting said cam to a drive member, causing said cam to rotate through a predetermined angle by a signal produced by said sensor means to displace said movable plate to a corresponding one of positions, and then keeping said cam stationary in that condition till a next signal is produced by said sensor means.

4,527,687

PACKAGE

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, Essington, Pa.

Division of Ser. No. 872,895, Jan. 27, 1978, Pat. No. 4,227,611, which is a division of Ser. No. 739,476, Nov. 8, 1976, Pat. No. 4,093,007. This application Mar. 24, 1980, Ser. No. 133,619
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—219 **5 Claims**



1. A package comprising

a tube of flexible material having a first and second end,

a first seal extending transversely across the tube and closing said first end,

a second seal extending transversely across the tube and closing said second end,

a chamber formed by said tube and said end seals for containing contents,

hollow stem dispensing means extending through and supported by said second seal with an inner end inside the chamber and an outer end outside the chamber,

means closing the outer end of the stem,

and a hypodermic needle adapted to be mounted on said stem to form an extension thereof,

whereby the hypodermic needle may be inserted into a patient and the tube may be squeezed by the fingers to dispense the contents from the tube chamber through the hypodermic needle into the patient,

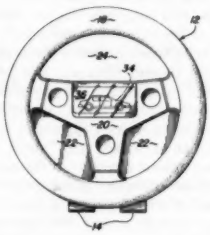
said stem closing means and said seals being ultrasonic seals.

4,527,688

TOY STORAGE CASE

Lawrence T. Jones, Playa del Rey; R. Stephen Lee, Westlake Village; Walter Moe, Santa Monica; Ashley G. Howden, Los Angeles, and Paul J. Ishikawa, Hermosa Beach, all of Calif., assignors to Universal International Holdings (USA), New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,395
Int. Cl.³ A63H *33/00;* **B65D** *69/00*
U.S. Cl. 206—315.1 **1 Claim**



1. A combination novel storage case for toy vehicles and simulated steering wheel for a vehicle comprising:

a circular profile bottom member having a plurality of separate compartments extending across the entire surface of the bottom member, each compartment being of a dimension to receive at least one toy vehicle, the bottom member further having an opening;

a first circular profile cover member connected to the bottom member to permit a hinged pivotal relative movement, the cover member further having an opening, the

respective openings being of a dimension to permit a child to grasp and carry the storage case, the first cover member further having a raised section to simulate spokes of a steering wheel, the peripheral portions of the bottom member and the first cover member forming a torus shaped configuration when joined together to simulate a vehicle steering wheel, the torus shaped configuration extending around the opening and providing a series of separate compartments separated by partitions around the opening;

a movable second cover member of a transparent plastic material positioned at the centroid of the torus shaped configuration and closing a display compartment, whereby the child can display a predetermined vehicle in the center of the simulated steering wheel;

a hinge coupled to the bottom and cover members to permit relative movement and access to all of the separate compartments, and

latching means for releasably latching the bottom and cover members together in a closed position.

4,527,689

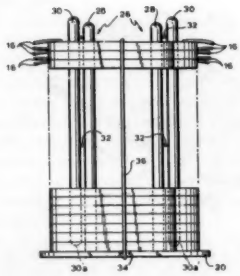
METHOD AND APPARATUS FOR MOUNTING CLIPS

Jonathan H. Meyers, 140 Riverside Dr., New York, N.Y. 10024

Continuation-in-part of Ser. No. 513,244, Jul. 14, 1983, Pat. No. 4,465,186. This application Dec. 15, 1983, Ser. No. 561,826

Int. Cl.[3] **B65D** *77/30, 85/24, 85/62*

U.S. Cl. 206—342 **13 Claims**



1. A method of mounting clips on a base, the clips being of the type having elongated openings, the base including spaced, substantially parallel clip retaining means extending therefrom, said method comprising the steps of:

(a) fabricating each of the clip retaining means to comprise an elongated clip receiving element, one end of which is fixedly mounted to the base and a rotation preventing member removably mounted to the element, in substantially parallel relation thereto;

(b) mounting sets of aligned clips on each of the clip retaining means by inserting same through the clip openings;

(c) encircling the clip sets and the base with a band to maintain the clips on the base; and

(d) removing the rotation preventing members.

4,527,690

TAPE CASSETTE CONTAINER

Kurt Schmidts, and Walter Schuett, both of Kehl, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

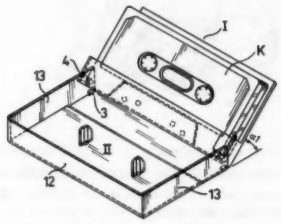
Filed Nov. 29, 1982, Ser. No. 444,961

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 8134835[U]

Int. Cl.[3] **B65D** *85/672*

U.S. Cl. 206—387 **11 Claims**

1. A protective container for a tape cassette comprising a bottom part having spaced apart axially aligned hinge pins, a lid part having a pouch, the walls of the pouch, which have outside portions, having groove-shaped recesses formed therein in which said hinge pins are received to form two pivot joints for enabling the lid part to be pivoted relative to the bottom part from a closed position in which said parts have substantially the shape of a flat, rectangular parallelepiped, and a pair of studs in the vicinity of the pivot joints, said groove-shaped recesses extending substantially vertically, and said studs being located substantially vertically above or below the



hinge pins, when the lid part is in the closed position and the container is lying flat and horizontally, so that the engagement of said studs by the walls of said recesses tends to hold the lid part in said closed position, and, after said lid part has been manually moved out of said closed position, engagement of said studs by said outside portions of the walls of said pouch limits the angle to which the lid part can be opened to an angle of substantially less than 180° from the closed position.

4,527,691

MAGNETIC TAPE CASSETTE

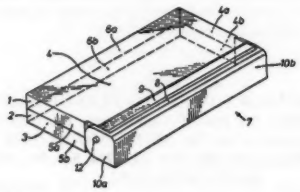
Albert Pertzsch; August Liepold, both of Munich; Hubert Brunner, Weil, and Ludwig Zeroni, Ottobrunn, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1984, Ser. No. 641,596

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331160

Int. Cl.[3] **B65D** *85/672*

U.S. Cl. 206—387 **2 Claims**



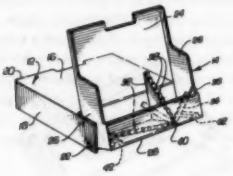
1. A magnetic tape cassette for magnetic recording and play-back devices, comprising a substantially rectangular, two-part housing which has an upper main wall and a lower main wall, each with three side walls, and an opening along its front side, along which the magnetic tape is transported from two plane-parallel positioned reels, and a pivotal front lid which partly overlaps the side walls and which releases and closes the opening, and which comprises an outer cover and an inner cover, by which the magnetic tape is enclosed in the closed position of the front lid, the lid being biassed by means of torsion springs, characterised in that one of the pivot pins **12** on the inside wall of the side part **10***a* of the front flap **7** accomodates a one-armed lid spiral spring **13**, the arm **16** of which, pointing towards the front lid, has a length which extends up to the outer cover **8** of the front lid, and the arm in the ready-made cassette lies in a groove **18** on the front end of the upper part of the cassette.

4,527,692

DISK STORAGE AND DISPLAY CONTAINER

Eli Neuman, Woodland Hills, Calif., assignor to PerfectData Corporation, Chatsworth, Calif.

Filed Dec. 27, 1983, Ser. No. 565,591
Int. Cl.³ B65D *85/30*
U.S. Cl. 206—444 **13 Claims**



1. A container for storing disk-containing jackets and for selectively displaying identifying indicia on the top marginal portions of said jackets, comprising:

a bottom wall, opposed side walls and opposed front and rear walls defining a storage chamber for the disk-containing jackets;

a support surface disposed in said storage chamber for supporting disk-containing jackets above said bottom wall;

said support surface and said bottom wall defining a compartment therebetween;

a display actuator member rotatably mounted in said compartment so as to be rotatable between a lowered position and a raised position;

said display actuator member having a series of steps provided thereon, each of said steps being adapted to engage the bottom edge of a disk-containing jacket and to raise such jacket to a display position upon rotation of said display actuator member from its lowered position to its raised position, whereby rotation of said display actuator member from its lowered position to its raised position will raise disk-containing jackets in said storage chamber into a stepped array with the top marginal portion of each jacket extending above the top edge of the jacket in front of it so as to display identifying indicia and thereby facilitate selection and removal of any desired disk; and

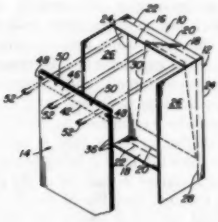
manually operable means connected to said display actuator member for rotating said display actuator member between its lowered and raised positions.

4,527,693

BOX DISPENSER FOR PAD OF PLASTIC BAGS

Hercules Membrino, 280 Paoli Pike, Malvern, Pa. 19355

Continuation-in-part of Ser. No. 588,567, Mar. 12, 1984, Pat. No. 4,500,000. This application Apr. 23, 1984, Ser. No. 602,693
Int. Cl.³ B65D *85/62*
U.S. Cl. 206—554 **9 Claims**



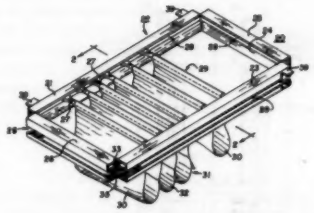
1. A plastic bag unit comprising a storage and dispensing container having an aperture in one face thereof, a plastic pad comprising a stack of overlying plastic pockets connected to each other by a common base portion, each of said pockets having a front face and rear face, said front face having an open mouth with a lip, and a selvage portion extending from said mouth and connected thereto by a score line, the selvage portions of all the pockets being connected to each other at least at the opposite end edges thereof by connecting means to form said base portion, said base portion being held in a substantially rigid position within said container with the front faces of the pockets aligned with said aperture and said lips within the area of said aperture in a position to be successively grasped and pulled through said aperture when exposed by removal of the next uppermost overlying pocket, the wall area of the container defining said aperture framing the uppermost pocket, whereby when a forward pull is exerted on the lip of said uppermost pocket, said uppermost pocket is torn along its respective score line from its selvage portion while said connecting means of said base portion exert a counterforce to initiate opening of the resultant bag and said frame simultaneously exerts an additional counterforce to complete said opening of said resultant bag.

4,527,694

SUSPENDABLE HANGER FRAMEWORK ASSEMBLY

William S. Bolt, 1010 Cuyahoga Dr., Bartlett, Ill. 60103, and Kenneth W. Wood, 1034 Viking Ct., Batavia, Ill. 60510

Filed May 27, 1982, Ser. No. 382,587
Int. Cl.³ A47F *7/16*
U.S. Cl. 211—46 **4 Claims**



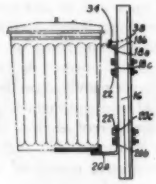
1. An improved hanger framework assembly to be suspended in the central opening of box-like container means including in combination side frame members and end frame members to be interconnected to comprise an integral framework assembly and defining a central opening therebetween, each of said frame members defining first and second channel openings therein, and each thereof having a first frame edge portion partially defining the first channel opening, hanger bar means extendible between oppositely disposed frame members and being insertable within the first channel openings and movable therealong, each hanger bar means including recessed portions thereof disposed inwardly adjacent to the end portion extremities thereof, said first edge portions of the frame members extending into the recessed portions of the hanger bar means, respectively, with the hanger bar means inserted into the first channel openings for preventing withdrawal of the hanger bar means from the first channel openings, pouch means suspendable from the hanger bar means, means for suspending the framework assembly with respect to the container means, corner brace means extendible into the second channel openings of abutting side frame members and end frame members for interconnecting the framework assembly, strap means circumferentially encircling the framework assembly and engageable with the corner brace means and insertable within the second channel openings of the frame members, respectively, elongated electrostatic charge insulting means (are) selectively suspended from the side frame members and end frame members, and strap fastener means and selected edge portions of the insulating means (are) to be received into the second channel openings for suspending the insulating means.

4,527,695

GARBAGE CAN RACK

Rondy Arms, 515 N. Dorothy, Shawnee, Okla. 74801

Filed Jul. 25, 1983, Ser. No. 516,920
Int. Cl.[3] A47G *29/00*
U.S. Cl. 211—71 3 Claims



1. A garbage repository system comprising:

an upwardly extending post adapted to be placed in the earth;

a first, upper, horizontally extending arm of L-shaped cross-section having a horizontally extending flange and a vertically projecting flange;

a vertical projection secured to the center of the upper horizontally extending arm and bolted to the upwardly extending post;

a pair of horizontally spaced, vertically extending handle engaging tabs secured to said upper, horizontally extending arm and spaced equidistantly on opposite sides of said upwardly extending post;

a second, lower horizontally extending arm of L-shaped cross-section having a horizontally extending flange and a vertically projecting flange extending upwardly from said horizontally extending flange of the lower arm and normal thereto, said second, lower horizontally extending arm extending parallel to said first, upper horizontally extending arm;

a vertical projection secured to the center of the lower horizontally extending arm and bolted to the upwardly extending post;

a pair of horizontally spaced, semi-circular supporting elements each secured at a point on its periphery to said lower, horizontally extending arm and extending therefrom as a cantilever, the points of securement of said supporting elements being spaced equidistantly from said post on opposite sides thereof, and also being spaced horizontally from the vertically projecting flange of said lower horizontally extending arm of L-shaped cross-section in a direction away from said post whereby a downwardly projecting rim or flange on the lower side of a garbage receptacle can be accommodated in the space between the respective semi-circular support element and the vertically projecting flange of said second horizontally extending of L-shaped cross-section, and said points of securement being disposed in substantially vertical alignment with said handle engaging tabs; and

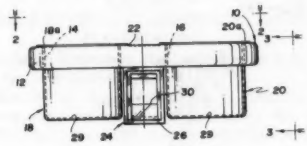
a pair of horizontally spaced, cylindrical garbage cans each having a handle on the side thereof engaged with one of said handle engaging tabs, and each having an annular flange projecting downwardly from the lower side thereof and concentrically encircling, and juxtapositioned with respect to, one of said semi-circular supporting elements, the respective annular flange of each of said garbage cans passing between one of said semi-circular supporting elements and the vertically projecting flange of said second, lower horizontally extending arm of L-shaped cross-section to thereby stabilize the cans.

4,527,696

AUTOMOBILE BEVERAGE HOLDER

Jimmy G. Harris, 902 W. Paterson, and Olen R. Harris, 2108 W. 3rd Ave., both of Flint, Mich. 48504

Filed Jul. 27, 1983, Ser. No. 517,702
Int. Cl.[3] A47F *5/00*
U.S. Cl. 211—86 6 Claims



1. A beverage holder for mounting on a forwardly oriented vehicle parking brake handle located between a pair of front seats, comprising:

a receiver having at least one opening for receiving a beverage container; and

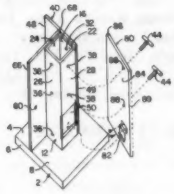
a mounting bracket fixed to the lower surface of said receiver, said bracket having front and rear portions and including a rearwardly extending, rectangular opening, said opening having top and bottom walls which taper from said front to said rear portion complementary in shape to said handle and having a resilient lining for engagement over such handle in tight holding relationship.

4,527,697

DISPLAY FIXTURE

Arthur R. Mastrodicasa, 5 Elmcrest Cir., Walpole, Mass. 02081

Filed Jul. 2, 1984, Ser. No. 627,236
Int. Cl.[3] A47B *47/00*
U.S. Cl. 211—189 8 Claims



1. A display fixture comprising a hollow channel member having a plurality of planar side walls and a last planar side wall, a panel member fixed to each of said plurality of planar side walls, respectively, fastener members extending through said panel members and said plurality of side walls into said channel member, fastener lock members disposed on said fastener members within said channel member, said channel member having a free end adapted to be open for access to a portion of said fastener members and manipulation of a portion of said fastener lock members, said last planar side wall having an opening therein near its end remote from said free end, said opening being adapted for access to a remainder of said fastener members and manipulation of a remainder of said fastener lock members, and a last panel member, clip means fixed to said last panel member, said opening being adapted to receive said clip means, said last side wall adjacent said opening being adapted to interconnect with said clip means to retain said last panel member on said last side wall.

4,527,698

METHOD OF AND APPARATUS FOR SUPPORTING ROPE OF CRANE HAVING ARTICULATING STRUCTURE

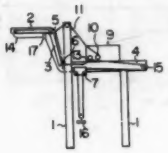
Kouji Nishihata; Ichiro Nakazima, and Mituo Hirata, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,512

Claims priority, application Japan, May 12, 1982, 57-78203

Int. Cl.³ B66C *23/82*

U.S. Cl. 212—187 **7 Claims**



1. A method of supporting a rope in a crane, said crane having a structure along which a trolley having a hoisting tackle suspended therefrom runs, said structure comprising a girder supported horizontally, a base boom and an end boom which are pivotably connected in series with each other at their opposing ends, so that said base boom is foldable relatively to said girder and end boom for elevation movement while said end boom is held substantially in horizontal posture, and a hoisting rope extended along said structure for suspending said tackle while being supported at the opposite ends of said structure, said method being characterized in that when said base boom is straightened horizontally, a rope support provided for supporting said hoisting rope between the opposite ends of said structure is positioned at the free end of said end boom, whereas, when said base boom is elevated, said rope support is moved to and held at a position on said end boom in the vicinity of the end thereof pivotably connected to said base boom.

4,527,699

VESSEL FOR STORING LIQUID

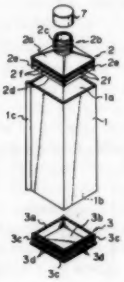
Kazuya Namba, Funabashi; Kazuya Yano, Yokohama; Hirosi Nakazima, Narita, and Yu Muraki, Tokyo, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,299

Claims priority, application Japan, Oct. 22, 1982, 57-159752[U]

Int. Cl.³ B65D *23/02*

U.S. Cl. 215—1 C **5 Claims**



1. A vessel for sealingly storing liquid therein, said vessel comprising:

a trunk member of rectangular cross-section having at least one open end made of a laminated sheet material having a thermally bonding synthetic resin layer at least on the inner surface thereof,

at least one end member having an axially extending flange portion provided with a thermally bonding synthetic resin layer on the outer surface thereof, said flange portion being adapted to be fitted in said open end of said trunk member so as to be thermally bonded thereto for forming hermetical sealing therebetween, and

hermetical sealing means formed between each respective corner of said open end of said trunk member and a respective corner of said flange portion of said end member, said sealing means comprising an outwardly projecting thin axial ear portion formed by said thermally bonding synthetic resin layer provided on the outer surface of said flange portion of said end member and positioned at the respective corner thereof, each of said ear portions being adapted to be deformed and sealingly fill a clearance between the respective corner of said open end of said trunk member and the respective corner of said flange portion of said end member when said flange portion is fitted in said open end and thermally bonded thereto, thereby permitting said clearance to be positively closed so as to insure hermetical sealing therebetween.

4,527,700

CLOSURE DEVICE FOR A NECKED CONTAINER

Alain Jupin, and Bernard Schneider, both of Sainte Menehould, France, assignors to Cebal, Clichy, France

Filed Mar. 6, 1984, Ser. No. 586,749

Claims priority, application France, Mar. 7, 1983, 83 04092; May 26, 1983, 83 09110

Int. Cl.³ B65D *1/02*

U.S. Cl. 215—32 **11 Claims**

1. A closure for a necked container comprising in combination:

(1) a container body terminating at one end in a necked portion including means defining a dispensing outlet;

(2) a frangible, separable tamperproof cap including a frangible zone integrally secured to said necked portion and over said outlet;

(3) a plurality of externally disposed spaced radially extending vertically oriented flanges carried by said cap;

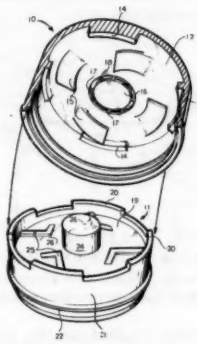
(4) a cover for said container including a portion configured to encircle said neck and said cap and provided with a plurality of radially inwardly directed rib members selectively axially engageable with said flanges on said cap for imparting rotational movement to said cap sufficient to fracture said cap from said neck;

(5) and retention means for securing said cover to said container prior to, during and after fracture of said cap and separation thereof from said dispensing outlet of said container neck.

4,527,701
TAMPER INDICATING CHILD RESISTANT CLOSURE

Paul E. Schaubeck, San Jose, Calif., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 29, 1984, Ser. No. 645,206
Int. Cl.[3] B65D *55/02*
U.S. Cl. 215—220 7 Claims

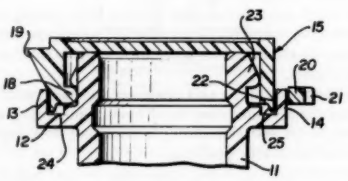


1. A tamper indicating child resistant closure for containers comprising: relatively rotatable inner and outer caps, said inner cap being internally threaded for engagement with threads on a container, a first set of engaging surfaces on said caps engageable with each other to turn said inner cap in a closing direction upon rotation of said outer cap in one direction, a second set of engaging surfaces on said caps operable to turn said inner cap in an opening direction upon simultaneous engagement of said surfaces and rotation of said outer cap in an opposite direction, said second set of engaging surfaces being engageable with each other only upon axial deflection of a part of said outer cap relative to said inner cap, an indicator element carried by said outer cap and connected thereto by frangible, severable members (webs), said inner cap including a projecting element disposed in alignment with and proximate the indicator element in said outer cap when said outer cap is not deflected and being engageable therewith to sever said frangible members upon axial deflection of said part of said outer cap to break said frangible webs.

4,527,702
TAMPER EVIDENT CONTAINER CLOSURE

Harry G. Heath, Jr., 192 Cumberland Rd., Milmay, N.J. 08340

Continuation-in-part of Ser. No. 448,303, Dec. 9, 1982, Pat. No. 4,457,437. This application Jun. 14, 1984, Ser. No. 620,489
The portion of the term of this patent subsequent to Jul. 30, 2001, has been disclaimed.
Int. Cl.[3] B65D *55/02*
U.S. Cl. 215—225 6 Claims



1. A tamper evident container and container closure arrangement comprising an interengaging container neck and freely rotatable container neck cap, cooperative means on said container neck and cap operable to impart to the cap permanent visual evidence of tampering in response to rotation of the cap in any direction to a cap release position, and separate cooperative means on said container neck and cap operable to impart to the cap permanent visual evidence of tampering as a result of prying the cap upwardly to separate it from the container neck.

4,527,703
FLEXIBLE STERILE CLOSURE SYSTEM FOR CONTAINERS

Robert Cummings, Richardson, Tex., assignor to U.S. Clinical Products, Inc., Richardson, Tex.

Continuation of Ser. No. 386,021, Jun. 7, 1982, Pat. No. 4,423,819, which is a continuation-in-part of Ser. No. 294,331, Aug. 19, 1981, Pat. No. 4,390,104. This application Oct. 11, 1983, Ser. No. 540,637
Int. Cl.[3] B65D *41/32*
U.S. Cl. 215—232 9 Claims

1. A flexible sealing cover for resealing a port of a pharmaceutical container, comprising:

a layer of flexible film forming a cover region of the sealing cover and being substantially impervious to moisture and bacteria, said film being plastically deformable under stress;

a pull tab region extending from said cover region;

an area of adhesive material bonded to a major surface of said layer of flexible film for providing an adhesive surface of the cover and pull tab regions;

means forming a first non-adhesive region within said area of adhesive material of said cover region and a second non-adhesive region within said area of adhesive material of said pull tab region; and

means for tamper proofing the seal whereby the seal is destroyed upon removal from the port of the container, thereby leaving a telltale strip of material on the port of the container and preventing reuse of the seal.

4,527,704
TAMPER INDICATING PACKAGE

Peter T. Swartzbaugh, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 26, 1984, Ser. No. 574,107
Int. Cl.[3] B65D *41/32*
U.S. Cl. 215—252 14 Claims

1. A tamper indicating package comprising

a container having a body portion and a neck portion,

said neck portion having external threads thereon,

said container having an annular bead spaced below the threads on the neck,

a closure having a top wall and a peripheral skirt,

said skirt having internal threads adapted to engage the threads on the neck of the container,

a tamper indicating band extending downwardly from said skirt,

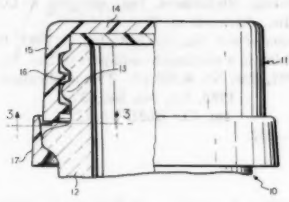
a plurality of circumferentially spaced integral bridges in-

cluding integral bridge portions interconnecting said skirt and said band,

said band having a bead extending radially inwardly adapted to engage the annular bead on the container when the closure is threaded on the container,

each of said bridge portions having a cross section such that the bridge portions have a greater width than thickness,

at least some of said bridge portions having a cross section in a circumferential direction with respect to said band and said closure which has a greater axial dimension with



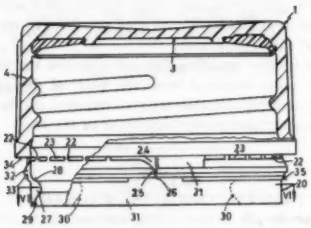
respect to said band and said closure than a circumferential dimension with respect to said band and said closure and others of said bridge portions having a cross section in a circumferential direction with respect to said band and said closure which has a greater circumferential dimension with respect to said band and said closure than an axial dimension with respect to said band and said closure such that at least some of the bridge portions will withstand the forces when the closure is applied to the containers and the bridge portions will be readily severed during removal of the closure.

4,527,705

BOTTLE STOPPER

José F. Prades, Torello, Spain, assignor to Vem De Tapas Metalicas, S.A., Barcelona, Spain

Filed Feb. 13, 1984, Ser. No. 579,575
Claims priority, application Spain, Jul. 29, 1983, 273813
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **8 Claims**



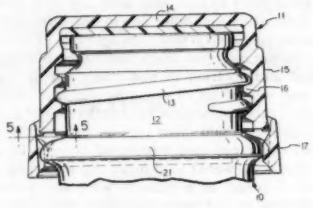
1. A bottle stopper of the type having a substantially rigid plastics body and a seal, said body having a cap form with an internally threaded side wall and said seal being applied to the area of the edge of the body bottom and the side wall area adjacent said bottom, wherein the body bottom is provided with a concentric rib and between said rib and the side wall a plurality of recesses while the side wall is provided on the inner side thereof with an annular flange close to the bottom and between said flange and the bottom a plurality of hollows, said seal being comprised between said rib and said flange and filling said recesses and hollows, said side wall being integrally axially attached to a security member, the transition between said side wall to said security member being constituted by weakened means and by a reinforced portion, said security member having on the inside thereof an inwardly extending transverse peak adapted to engage an outwardly extending rib of the vessel, wherein said security member is provided with an aperture having a pointed portion adjacent said reinforced portion having the apex thereof extending away from the cap portion, said aperture being adjacent said side wall and wherein said security member has a thin portion centered relative to said pointed portion from which said inwardly extending transverse peak is missing, forming an ideal line of priority rupture beyond said apex.

4,527,706

TAMPER INDICATING PACKAGE

Peter T. Swartzbaugh, Toledo, and Edward M. Hehl, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 13, 1984, Ser. No. 579,616
Int. Cl.³ B65D *45/32*
U.S. Cl. 215—252 **10 Claims**



1. A tamper indicating package comprising

a container having a body portion and a neck portion,

said neck portion having external threads thereon,

a plastic closure having a top wall and a peripheral skirt,

said skirt having internal threads adapted to engage the threads on the neck of the container,

a tamper indicating band extending downwardly from said skirt,

said band having a greater diameter than the skirt of the closure,

an integral weakened portion interconnecting said band to said skirt comprising a plurality of circumferentially spaced integral bridge portions,

said container having an annular bead spaced below the threads on the neck,

said band surrounding said annular bead having a radially inwardly extending bead adapted to engage the annular bead on the container when the closure is threaded on the container,

said annular bead on said container and said radial bead on said tamper indicating band having interengaging means which are operable during unthreading of the closure to shear the bridge portions,

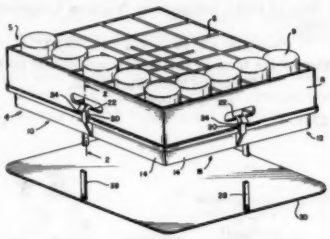
said interengaging means comprising at least one projection on said bead on said container extending radially outwardly from said bead and defining a shoulder and at least one lug on said bead of said tamper indicating band extending radially inwardly and engageable with said shoulder when the closure is on the container.

4,527,707

DEVICES FOR SECURING A DEBRIS HOLDING TRAY TO A GLASS OR DISH RACK

Mark S. Heymann, 1777 N. California, Suite 330, Walnut Creek, Calif. 94596, and Steven Bachenheimer, 415 Foxdale La., Arlington Heights, Ill. 60004

Filed Apr. 16, 1984, Ser. No. 600,387
Int. Cl.[3] B65D *11/10*
U.S. Cl. 220—1 R 22 Claims



1. A tray device for carrying at least one article, said tray device comprising:

a rack for holding said at least one article;

a debris holding tray arranged beneath said rack, said debris holding tray adapted to contain debris dropping from said at least one article;

a device for releasably securing said debris holding tray to said rack, said device including

a resilient member extending from said debris holding tray, said resilient member being disposed on a side wall of said debris holding tray;

said resilient member comprising a dog for engaging said rack; and

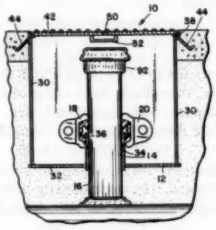
said dog comprising a first latch face with means for engaging a side of said rack.

4,527,708

LIQUID TANK SPILLAGE CONTROL SYSTEM

Richard E. Dundas, Rockford, and Gerald H. Visser, Grand Rapids, both of Mich., assignors to Plymouth Tank of West Michigan, Inc., Grand Rapids, Mich.

Filed May 14, 1984, Ser. No. 610,265
Int. Cl.[3] B65D *25/00*
U.S. Cl. 220—18 21 Claims



1. A spill control device for underground liquid storage tanks used in the storage of toxic or flammable materials, comprising:

a liquid impermeable spill collecting tank having a top and a bottom, said top having an access opening thereat that provides sufficient clearance for the passage of a fill hose therethrough, said tank having a pipe aperture through said bottom of a dimension sufficient to provide the close reception of a liquid storage tank fill pipe therethrough; and

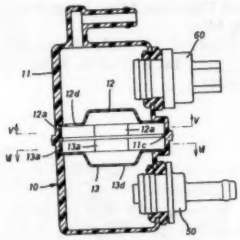
means for sealing said tank bottom about a liquid storage tank fill pipe received through said pipe aperture to prevent fluid passage through said pipe aperture, whereby said tank forms a liquid impermeable container about the upper end of a liquid storage tank fill pipe when assembled thereon to prevent liquid contaminants from entering the ground surrounding said pipe.

4,527,709

RESERVOIR ASSEMBLY

Hiroyuki Kondo; Yoshikane Yoshimura, both of Kariya, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 21, 1984, Ser. No. 622,880
Claims priority, application Japan, Jun. 23, 1983, 58-96755[U]
Int. Cl.[3] F51B *7/10*; B65D *1/24*
U.S. Cl. 220—22 5 Claims



1. A reservoir assembly comprising:

a pair of cup-shaped housing members each made of thermoplastic resin and having an opening end, said housing members being integrally secured by heat welding to each other at their opening ends; and

a partition plate arranged within said housing members to subdivide the interior of said reservoir assembly into two chambers;

wherein one of said housing members is formed at the opening end portion thereof with a stepped inner wall which is coupled with the outer periphery of said partition plate in such a manner that said partition plate is positioned inside the opening end of said housing member and fastened in place by an annular bead which is radially inwardly extruded at the opening end of said housing member during the heat welding process.

4,527,710

SEALING COVERS FOR AIR BOXES

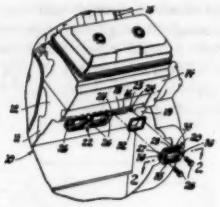
Jose M. Lopez-Crevillen, Westland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 30, 1984, Ser. No. 635,599
Int. Cl.[3] B65D *53/00*
U.S. Cl. 220—378 6 Claims

1. A plate-like steel element having a body of formable material of relatively thin but stiff configuration and defining opposite faces,

an essentially straight sided seal groove in one of said faces and adapted to receive a resilient seal, said one face being

engageable with a smooth surface to maintain the seal in sealing engagement with said surface, and



a stiffening rib on the other of said face and extending parallel with and directly opposite said groove to stiffen said element along the extent of said groove and rib,

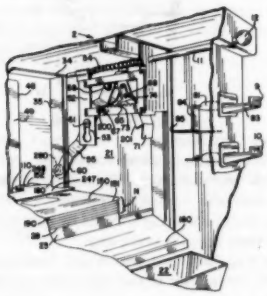
whereby a highly effective seal element is provided.

4,527,711

VENDING MACHINE FOR EDGE ENGAGING AND DISPENSING SINGLE ARTICLE

Bob G. Harrell, Carrolton, Miss., assignor to News Vend 1, Inc., Greenwood, Miss.

Filed Jul. 11, 1983, Ser. No. 512,455
Int. Cl.³ B65G *59/02*
U.S. Cl. 221—244 **14 Claims**



1. An article dispensing machine for dispensing one article at a time, said machine comprising, in combination:

an article having an edge portion;

means for supporting said article;

means for enclosing said article for preventing uncontrolled access to said article;

means for traversing said supporting means;

a manually operable linearly movable pull bar pivotally linked to said traversing means for manually actuating said traversing means, said pull bar having affixed to it a member to it a member having equally spaced notches;

means for engaging at least a portion of said edge portion of said article, said engaging means being connected to said traversing means for causing said article to traverse said supporting means as said traversing means traverses said supporting means;

means for locking said pull bar, said locking means having a pawl coacting with said notches on said member affixed to said pull bar and having a locking position in which said pawl engages a notch in said bar and prevents movement of said bar in one direction to prevent said traversing means from traversing said support means; and

means for unlocking said locking means for enabling said actuating means to cause said traversing means to traverse said supporting means;

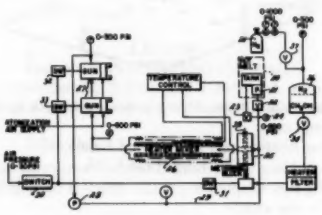
whereby actuating said unlocking means unlocks said locking means for enabling said actuating means to cause said traversing means to traverse said support means for causing said article engagement means engaged with said portion of said article to force said article to an accessible location for enabling said article to be removed from said machine.

4,527,712

METHOD AND APPARATUS FOR DISPENSING LIQUID COMPOSITIONS

Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jul. 19, 1979, Ser. No. 58,837
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.³ B05B *7/16*
U.S. Cl. 222—1 **17 Claims**



9. A method for dispensing foam coating compositions comprising

storing a liquid composition comprising a film-forming solid,

transferring a portion of said liquid composition to a separate loop maintained under pressure,

separately supplying a blowing agent to said loop,

circulating said liquid portion in said loop mixed with said blowing agent,

employing a single unit for coincidentally heating and mixing said liquid composition and blowing agent mixture in said loop at a temperature above the foaming point of said blowing agent, said composition being maintained under pressure in said loop, said single unit including a means in the loop for imparting heat to said liquid mixture and baffles for causing mixing of said liquid mixture,

selectively dispensing the composition from the circulating loop to normal atmospheric conditions for foaming said composition, and

forming a coating upon a substrate with the dispensed film-forming solids.

4,527,713

COIN OPERATED FRAGRANCE DISPENSER

James L. Ingram, Pine Bluff, Ark., assignor to Car Fresh Manufacturing Company, Inc., Pine Bluff, Ark.

Filed Jun. 13, 1984, Ser. No. 620,392
Int. Cl.³ G07F *13/08*
U.S. Cl. 222—2 **4 Claims**

1. A coin operated fragrance dispenser for deodorizing and freshening automobiles, trucks and vehicles, said dispenser comprising:

a rigid generally cubical cabinet adapted to be secured to a supporting structure or surface;

reservoir means disposed within said cabinet for providing at least one source of fragrance to be dispensed;

pressure means for establishing a source of air pressure for dispensing fragrance;

hand applicator means responsive to said pressure means for dispensing a fragrance;

coin acceptance means for actuating said pressure means in

response to the input of a suitable money value of coins by a consumer; and;

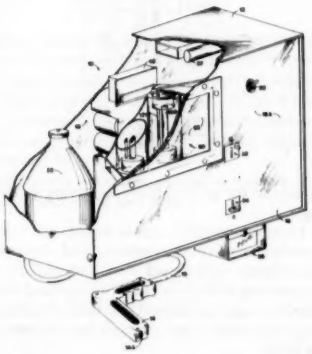
a display module for visually attracting customers, the display module comprising:

a rigid enclosure having a top, a bottom, an interior and a translucent front permitting the visual inspection of said enclosure interior;

at least one translucent, sealed containment compartment disposed within said enclosure and extending between said enclosure top and said enclosure bottom, said containment compartment having an interior;

a first fluid control compartment disposed within said containment compartment upon the bottom of said enclosure;

first vent means for establishing fluid flow passage between said first fluid control compartment and the interior of said containment compartment;



a second fluid control compartment disposed within said containment compartment interior and spaced apart from said first fluid control compartment;

second vent means for establishing fluid flow passage between said second fluid control compartment and said interior of said containment compartment;

elongated, tubular passageway means extending in fluid flow communication interiorly of said containment compartment between said first and second fluid control compartments;

a viscous fluid disposed within said containment compartment; and,

pneumatic passageway means extending interiorly of said first fluid control compartment for inputting air into said first fluid control compartment for pneumatically pressurizing same to circulate said viscous fluid between said first and second fluid control compartments.

4,527,714

PRESSURE RESPONSIVE HOPPER LEVEL DETECTOR SYSTEM

Harold L. Bowman, Batesville, Ark., assignor to White River Technologies, Inc., Batesville, Ark.

Filed Feb. 18, 1983, Ser. No. 467,959

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—56 **7 Claims**

1. A level monitoring and control system to maintain the level of granular materials such as fly ash and grain in a storage hopper subject to variations of quantities of materials accumulating in the hopper, comprising in combination,

a generally confined storage hopper for receiving granular materials having walls surrounding an interior storage region,

means for variably discharging granular materials into the hopper to fall by gravity to a lower portion thereof and to reside therein at a variable level,

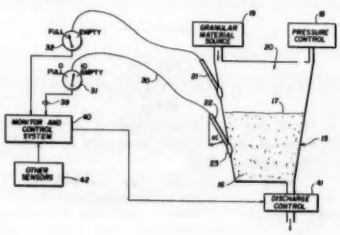
means for removing granular materials from the hopper,

pressure control means for establishing within the hopper in the region above the level of materials therein a pressure in the areas above and below the granular materials,

a single hollow pipe means having a single communication passageway extending through a port in said hopper walls into said interior storage region,

conveyance means coupling said pipe means passageway in a pressure confining flowless channel to a measuring station when the granular material in said hopper covers the port of said communication passageway, and

pressure responsive detection means at said measuring station coupled to said conveyance means for providing an indication of the pressure in said communication passageway within limits distinguishing two conditions, one when



said port is surrounded by the materials in the hopper, and the other when said port extends into a space above the level of materials in said hopper.

7. The method of detecting the level of granular materials such as fly ash in a hopper presenting a internal hopper pressure above and below the level of materials in the hopper, comprising the steps of,

sampling through a single flowless pressure conveying communication passageway extending into the hopper interior when the granular material in said hopper covers the port of said communication passageway so that the pressure at said port position in the hopper signifies a predetermined level of material, and

distinguishes whether the level of materials is above the port by means of significantly different pressure level in said passageway when the port is covered and uncovered by the granular materials.

4,527,715

AUTOMATIC VALVE SHUT-OFF SYSTEM

Leonard A. Rosenbaum, Old Bethpage, N.Y., assignor to CVD Equipment Corp., Deer Park, N.Y.

Filed Feb. 8, 1984, Ser. No. 578,085

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—61 **12 Claims**

1. Apparatus for the remote actuation of a valve with a manually operable valve handle on a gas cylinder comprising:

a. shaft means for engaging said valve handle and selectively moving said valve between its closed position and its open position;

b. pneumatic means connected to said shaft means for actuating the latter;

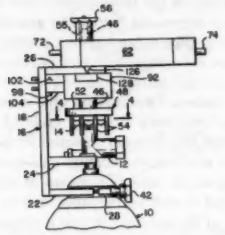
c. means for being removably connected to said cylinder to support said shaft means and said pneumatic means;

d. means located remotely from said cylinder for controlling operation of said pneumatic means;

e. a source of compressed gas; and

f. initiation means included in said controlling means for

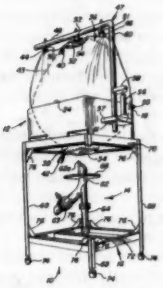
selectively directing flow of said compressed gas under pressure to said pneumatic means for rotating said shaft means in the direction of closing said valve or rotating said shaft means in the direction of opening said valve.



4,527,716
APPARATUS FOR DISPENSING MATERIAL FROM A BAG

Louis M. Haas; Joy L. Williams, both of Newark, and Boyd E. Smith, Fremont, all of Calif., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed May 13, 1983, Ser. No. 494,182
Int. Cl.³ B67B *7/26;* **B65G** *65/34*
U.S. Cl. 222—83.5 **8 Claims**



1. Apparatus for dispensing material from a bulk bag having an inner liner and having open upper and lower ends which may be held closed by drawstrings, the apparatus comprising:

a cradle assembly for supporting the bag, the cradle assembly including a cradle having a bottom portion defining an opening through which material from the bag may be passed, a pair of generally horizontal frame members of generally rectangular cross-section disposed on opposite sides of the cradle assembly for accommodating fork lift tines, and an overhead support assembly for upholding the upper end of the bag as the bag empties;

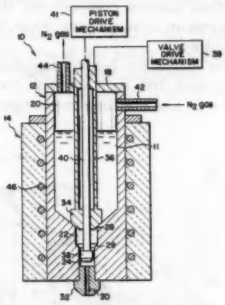
a discharge assembly including a discharge tube positioned beneath the opening in the cradle for receiving material from the bag and having a sharpened upper end for piercing the liner of the bag, valve means for regulating the flow of material through the discharge tube, a collar affixed to the exterior of the tube near its upper end to restrict communication between the exterior and the interior of the bag liner adjacent the exterior of the tube, and drive means for raising and lowering the discharge tube; and

a frame for supporting the cradle assembly and discharge assembly in predetermined relation to one another.

4,527,717
APPARATUS FOR QUANTITATIVELY SUPPLYING LIQUID

Takao Emoto, Kitakami, and Yoshitaka Nagata, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 421,886
Claims priority, application Japan, Oct. 15, 1981, 56-163420
Int. Cl.³ B22D *35/06;* **B67D** *5/62*
U.S. Cl. 222—593 **19 Claims**



1. An apparatus for quantitatively supplying a viscous liquid comprising:

a vessel for containing the viscous liquid, said vessel having first, second and third chambers and first and second communicating holes, said first and second chambers communicating with each other through said first communicating hole and said second and third chambers communicating with each other through said second communicating hole;

a nozzle communicating with said third chamber for supplying quantitative amounts of the viscous liquid from said vessel;

means for selectively opening and closing said first communicating hole, said opening and closing means being selectively movable to a closed position which closes said first communicating hole and prevents the flow of viscous liquid from said first chamber to said second chamber and to an open position which opens said first communicating hole to allow the flow of viscous liquid from said first chamber to said second chamber; and

control means for restraining the flow of viscous liquid from said second chamber to said third chamber when said opening and closing means is in said open position, for supplying a predetermined amount of viscous liquid from said second chamber to said third chamber, when said opening and closing means is in said closed position, and for supplying a predetermined amount of viscous liquid from said third chamber through said nozzle.

4,527,718
APPARATUS FOR SHIELDING MOLTEN METAL DURING TEEMING

Michael F. E. Kingston, Kingsley, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 8, 1982, Ser. No. 439,694
Claims priority, application United Kingdom, Dec. 4, 1981, 8136603
Int. Cl.³ B22D *41/00*
U.S. Cl. 222—603 **6 Claims**

1. An apparatus for shielding a stream of molten metal during teeming comprising in combination:

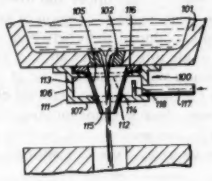
a generally cylindrical housing containing means to mount said housing to a tundish or ladle;

an upper inwardly projecting lip disposed within said hous-

ing having a central aperture with a circular opening therethrough;

a lower inwardly projecting lip disposed axially apart from said first lip, said second lip having a smaller central aperture with a circular opening axially aligned with the aperture in said first lip;

a truncated conically shaped compressible ceramic ring having a flange on the wider end, said flange projecting



radially outward and adapted to be removably positioned in axial alignment with said housing in said apertures with said flange spaced above said upper lip, whereby when said ring is urged through said apertures, the surfaces of said apertures engage and compresses said ceramic to provide a generally gas tight annular shaped passage around said ring; and

means to admit a gas to the annular shaped passage defined by said housing and said ring.

4,527,719

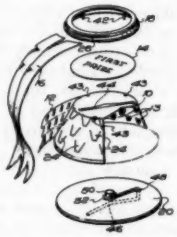
METHOD FOR MANUFACTURING ROSETTES

Hubert W. Mackrill, Haigh Head, Hoylandswaine, Sheffield, England

Filed Feb. 9, 1983, Ser. No. 448,393

Int. Cl.[3] **D04D** *7/04, 9/04*

U.S. Cl. 223—44 **6 Claims**



1. A method of making a rosette, the method including the steps of moulding a 3-dimensional body part with a plurality of radially outwardly projecting resilient clips arranged in circumferential rows; pre-pleating lengths of ribbon; securing the lengths of ribbon as radiating bands on the body part by means of said resilient clips, the clips engaging radially inner edge portions of the respective bands of pre-pleated ribbon and the radially inner bands masking from view the resilient clips securing the band immediately outside the respective inner band; and snap fitting a rim element on a portion of said body part so that the resilient clips securing the radially innermost band of pre-pleated ribbon are masked from view by said rim element.

4,527,720

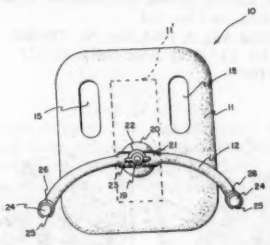
PAINT CAN HOLDER OR THE LIKE

Arthur R. Hayes, Rte. 3, Box 357, Rocky Mount, N.C. 27801

Filed Sep. 29, 1983, Ser. No. 537,103

Int. Cl.[3] **A46B** *17/00*

U.S. Cl. 224—148 **7 Claims**



1. A support means for use in connection with a container having a bail-like handle pivotally connected thereto comprising a backing means; a bail support means rotatively mounted on said backing and outwardly projecting therefrom so that its axis of rotation lies on a plane generally perpendicular to the axis of rotation of said bail-like handle of said supported container; means adjacent the outer portion of said support means for engaging each end of said bail adjacent to its pivoted connections with said container; means for securing said bail to said support means; and mounting means for said backing means whereby said container can be mounted adjacent to but away from the body of the user thereof and will remain level during normal movement.

4,527,721

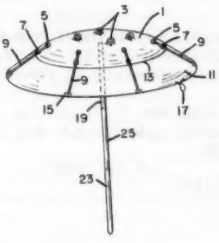
COMBINATION CARRYING SLED AND BEACH UMBRELLA

Richard M. Goldstein, 114 Barberry La., East Hills, N.Y. 11577

Filed Sep. 30, 1982, Ser. No. 428,693

Int. Cl.[3] **A45B** *3/00*

U.S. Cl. 224—151 **15 Claims**



1. A combination umbrella and carrier which comprises:

(a) a thin rigid concave member having a continuous outer perimeter,

(b) a thin flexible member secured relative to one surface of said rigid member and extending beyond and about said perimeter

(c) plural removable support means securable to said rigid member and said flexible member for supportably extending said flexible member beyond the perimeter of said rigid member,

(d) means disposed in the outer perimeter region of said flexible member and responsive to a predetermined force thereon for drawing together the perimeter region of said flexible member to form a substantially closed cover for the concave side of the rigid member, and

(e) means on the concave surface of said rigid member for receiving a pole.

4,527,722

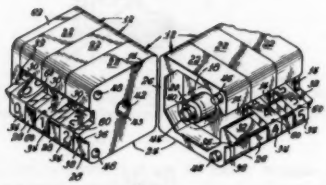
MULTIPLE UNIT TAPE DISPENSER

Gray Strachan, Beverly Shores, Ind., assignor to Stranco Products, Inc., Michigan City, Ind.

Filed Aug. 3, 1983, Ser. No. 520,062

Int. Cl.³ B26F *3/02*; B65D *85/671*

U.S. Cl. 225—106 **20 Claims**



1. A tape dispenser comprising:

a. a generally hollow plastic housing having one closed side and one side open sufficiently to permit insertion of a roll of tape within the hollow plastic housing,

b. a front dispenser wall having a slot formed across the width of said housing, said slot being dimensioned to permit withdrawal of tape longitudinally from a roll of tape within said housing,

c. a tape support shelf extending outwardly from said front dispenser wall adjacent said slot, said shelf being positioned to underlie a length of tape when withdrawn from said housing,

d. a spindle within said housing and attached to said closed side for mounting of a roll of tape within said housing, said spindle extending across the width of said housing, and

e. means for attaching one housing axially to a second housing, said attaching means including an extension of said spindle protruding from one side of said housing and a corresponding socket in the other side of said housing for receiving said extension.

4,527,723

CHAIN BRIDLE EQUIPMENT FOR KEEPING METAL STRIP TENSIONS AT A CONSTANT LEVEL

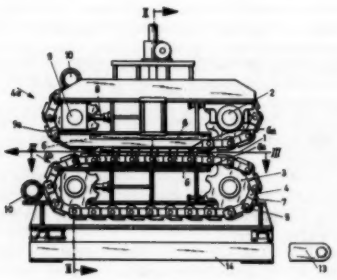
Norbert Umlauf, Haferkamp 64, 5800 Hagen, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,674

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208158

Int. Cl.³ B65H *17/34*

U.S. Cl. 226—172 **7 Claims**



1. A device for applying tension and back tension to metal strip, such as narrow strips to be wound up under separate back tension such as in strip lines, comprising two oppositely arranged endless revolving chain systems forming a region therebetween in which a strip is to be clamped, each of said chain systems comprising a plurality of chain segments (**4**) which clamp the strip therebetween, wherein the improvement comprises one of said chain systems is located above the other providing an upper said chain system (**4*a***) and a lower said chain system (**4*b***), an upper gib (**6*a***) is located in said upper chain systems and a lower guide gib (**6*a***) is located in the lower one of said chain systems, said upper and lower guide gibs (**6*a***) support said chain segments in the region of said chain systems in which the strip is clamped therebetween, and each of said upper and lower guide gibs (**6*a***) has an inlet end and an outlet end in spaced relation with an inlet curve at the inlet end and an outlet curve at the outlet end, so that said chain segments of said upper and lower chain systems moving over said inlet end gradually approach one another and moving over said outlet ends gradually move away from one another.

4,527,724

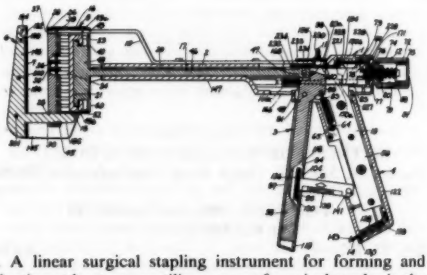
DISPOSABLE LINEAR SURGICAL STAPLING INSTRUMENT

Hector Chow, Cincinnati, and Hugh Melling, West Chester, both of Ohio, assignors to Senmed, Inc., Cincinnati, Ohio

Filed Jun. 10, 1983, Ser. No. 503,231

Int. Cl.³ A61B *17/04*

U.S. Cl. 227—8 **22 Claims**



1. A linear surgical stapling instrument for forming and implanting at least one rectilinear row of surgical staples in the tissue of a patient, said instrument comprising an elongated body terminating at its forward end in a fixed jaw, an anvil mounted on said fixed jaw, a basic assembly slidably supported by said body and shiftable longitudinally thereof, said basic assembly comprising a movable jaw subassembly, a trigger subassembly, a handle subassembly and an adjustment bolt-adjustment knob subassembly all operatively joined together, said movable jaw subassembly comprising a cartridge containing at least one row of surgical staples and having a forward surface facing and parallel to said anvil, a hollow casing affixed to said cartridge, a driver for said staples slidably mounted within said casing, means to shift said driver within said casing between a retracted position and a staple driving position to drive said staples through the tissue and against said anvil over a range of distances between said cartridge and said anvil constituting the working gap of the instrument, said driver shifting means comprising an elongated driver rod having a forward end connected to said driver within said casing and a rearward end connected to said trigger assembly, said trigger assembly having an upper end pivotally affixed to said basic assembly and a lower free end, said trigger being pivotable between an unactuated position spaced from said handle assembly and wherein said driver is in said retracted position and an actuated position adjacent said handle assembly and wherein said driver is in said staple driving position, said adjustment bolt being affixed to said basic assembly within said body, said adjustment knob being captively and rotatably

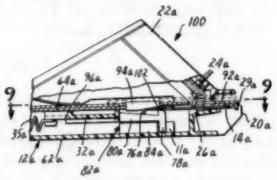
mounted at the rearward end of said body and being threadedly engaged with said adjustment bolt such that rotation of said adjustment knob in one direction will shift said adjustment bolt and said basic assembly rearwardly with respect to said body with said movable jaw assembly shifting away from said fixed jaw and said cartridge shifting away from said anvil, and rotation of said adjustment knob in the other direction will shift said basic assembly forwardly with respect to said body and said movable jaw assembly toward said fixed jaw and said cartridge toward said anvil, an alignment and retaining pin slidably mounted on said body, said alignment pin having a free forward end, said alignment pin being shiftable longitudinally of said body between a retracted position wherein said forward end of said pin lies within said casing and an extended position wherein said free end passes through coaxial perforations in said cartridge and said anvil and into a recess in said fixed jaw to assure proper alignment of said cartridge and said anvil, indicator means to indicate when the distance between said cartridge and said anvil is at and within said working gap of said instrument, and safety means to assure proper sequential operation of said instrument.

4,527,725

STAPLER WITH RETRACTABLE ANVIL

Floyd L. Foslien, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 4, 1982, Ser. No. 439,134
Int. Cl.³ A61B *17/04*
U.S. Cl. 227—19 **2 Claims**



1. A stapler adapted to bend a staple having a central portion and an end portion projecting from each end of said central portion closed into a generally loop-like shape by bending at least one part of said central portion, said stapler comprising:

a housing having a passageway with an outlet opening;

an anvil having a contact surface adapted to be engaged by the central portion of a said staple;

means mounting said anvil on said housing for movement between an engage position projecting across said passageway at said outlet opening, and a retracted position out of said passageway;

means for positioning a said staple at said anvil with the central portion of the staple adjacent said contact surface and the end portions of said staple flanking said anvil;

a ram mounted on said housing for movement between a load position affording positioning a said staple along said passageway between said ram and anvil when said anvil is in said engage position, and a formed position with said ram more closely adjacent said anvil to bend the staple closed around said anvil;

drive means for moving said ram between said load and formed positions; and

cam means between said drive means and said means for mounting said anvil for moving said anvil to said engage position prior to movement of said ram to said formed position, for maintaining said anvil at said engage position during movement of said ram fully to said formed position, and for subsequently moving said anvil to said retracted position during movement of said ram from said formed position to said load position;

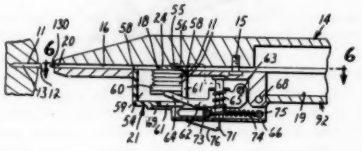
said housing including a surface positioned to support the central portion of a said staple closed around said anvil to prevent movement of the closed staple relative to said housing during movement of said anvil from said engage to said retracted position.

4,527,726

BONE STAPLER

Robert L. Assell, West St. Paul, and Edward P. Skwor, Burnsville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 18, 1983, Ser. No. 514,928
Int. Cl.³ A61B *17/04*
U.S. Cl. 227—19 **3 Claims**



1. A bone stapler adapted for use with generally U-shaped staples each comprising a central portion and two generally parallel leg portions projecting generally in the same direction from opposite ends of its central portion and having distal ends, said stapler comprising:

a housing having a passageway extending from an inlet opening to an outlet opening, said passageway being adapted to guide a single staple moved from the inlet to the outlet opening with the distal ends of its legs leading;

means for biasing a stack of staples into said inlet opening;

a driver having an end portion adapted to engage the central portion of a said staple and being mounted on said housing for sliding movement between a load position with the driver spaced from the inlet opening to afford movement of one of the staples into the passageway, along said passageway through an intermediate position with said end portion pushing the staple, to an eject position at which the end portion of the plunger pushes the staple out said outlet opening and at which eject position the driver is stopped by said housing, said driver having a length along said passageway so that a portion thereof will be positioned adjacent said inlet opening during movement of said ram from said intermediate to said eject position to prevent movement of a second staple in said stack into said passageway through said inlet opening;

drive means adapted to be manually activatable for rapidly and forcefully propelling said driver along said passageway toward said eject position and for subsequently biasing said driver for movement from said eject position back to said load position;

blocking means for automatically preventing movement of said driver from said intermediate to said load position after movement of said driver from said load to said eject position so that with said driver in said load position, said drive means may be manually activated a first time to drive a staple to said outlet opening and may subsequently be manually activated an additional number of times to further impact that driven staple; and

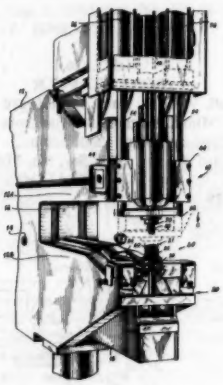
manually activated means for resetting said blocking means to allow return movement of said driver from said intermediate to said load position.

4,527,727

STABILIZED ULTRASONIC WELDING APPARATUS

Theodore A. Renshaw, North Babylon, N.Y., assignor to Fairchild Industries, Inc., Chantilly, Va.

Filed Apr. 12, 1983, Ser. No. 484,180
Int. Cl.[3] B23K *20/10*
U.S. Cl. 228—1.1 8 Claims



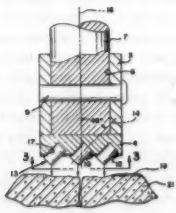
1. Ultrasonic vibratory spot welding apparatus of the type having a welding tip and a complimentary anvil both mounted on a stationary welding frame and defining a throat into which workpieces may be inserted for welding, said welding tip comprising one end of a vibratory reed and adapted to introduce into and through said workpieces high frequency vibratory energy in order to effect a weld between said workpieces, wherein said apparatus includes clamping means associated with both the welding tip and the anvil for clamping together said workpieces prior to and during welding, said clamping means being mounted on a clamping frame which is substantially independent in movement of said stationary welding frame.

4,527,728

TOOL FOR SCARIFYING CONCRETE

Robert Perez, Santa Clara, Calif.

Division of Ser. No. 472,630, Mar. 7, 1983, Pat. No. 4,451,093, which is a continuation of Ser. No. 215,055, Dec. 10, 1980, abandoned. This application Jan. 27, 1984, Ser. No. 574,334
Int. Cl.[3] B23K *1/04*
U.S. Cl. 228—119 3 Claims



1. In a tool for scarifying concrete, said tool comprising a main body having a working face thereon and a plurality of elongated carbide tips each symmetrical about a longitudinal axis and embedded and brazed in bores in said main body at an angle thereto so as to provide a carbide tip portion projecting from the working face thereof at an angle to present a flat end face and at least one edge defined by at least two divergent surfaces, the method of reconditioning the tool after each of said edges has been worn flat from use, consisting of the steps of:

(a) heating the main body to a temperature sufficient to liquify the braze material in each bore surrounding the embedded portion of each elongated carbide tip;

(b) rotating each elongated carbide tip about its own longitudinal axis through an arc of revolution of less than 360° while said braze material is in its liquified state; and

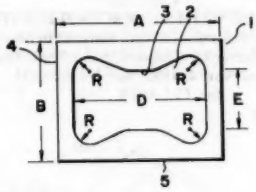
(c) causing said main body to cool following rotation of said carbide tips whereby said braze material solidifies to embed and rebraze said carbide tips to said main body.

4,527,729

DIE FORMING METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Yokohama, Japan

Filed Nov. 3, 1982, Ser. No. 438,810
Claims priority, application Japan, Nov. 7, 1981, 56-178655
Int. Cl.[3] B23P *1/00*
U.S. Cl. 228—162 3 Claims



1. A method of forming a die product with a cavity of a desired die contour, the method comprising the steps of:

(a) selecting a plurality of solid rectangular parallelepipedal blank workpieces such that, and planning to arrange them in a format such that, a die blank may be assembled therefrom having frame construction with limbs enclosing a cavity having a contour at least roughly approaching said desired die contour but smaller than said desired die contour;

(b) permanently joining said selected blank workpieces so that said selected blank workpieces form said limbs in said planned format of arrangement at abutting joints of said limbs and firmly affixing them together at said joints to produce a die blank frame with said cavity of rough-shaped contour; and thereafter

(c) machining said die blank to progressively develop said desired contour therein from said rough-shaped contour by removing material laterally from each of said blank workpieces.

4,527,730

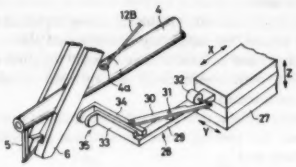
WIRE BONDING APPARATUS

Yuji Shirai, Fuchu; Kanji Otsuka, Higashiyamato; Tamotsu Usami, Kokubunji, and Yasuyuki Yamasaki, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,569
Claims priority, application Japan, Feb. 10, 1982, 57-18752
Int. Cl.[3] B23K *37/04, 1/06*
U.S. Cl. 228—179 8 Claims

1. A wire bonding apparatus comprising a bonding tool means for bonding a wire at a first bonding region and a second bonding region of an article to be wire bonded, wire guide means disposed in proximity of said bonding tool means for guiding the wire to be bonded, means for moving the bonding tool means relative to the article to be wire bonded, means for moving the wire guide means vertically and transversely independently of a movement of the bonding tool means, the wire guide means including means for altering a shape and a length

of a wire loop defined between the first bonding region and the second bonding reion during a bonding of the wire, said means



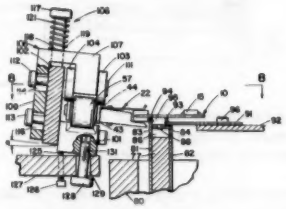
for altering including clamp means arranged at the end of said wire guide means for clamping a portion of the wire.

4,527,731

METHOD AND APPARATUS FOR APPLYING STRIPES OF SOLDER TO ARTICLES

William C. Kent, and Charles H. Payne, both of Garland, Tex., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 481,088
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—180.2 **19 Claims**



1. An apparatus for applying solder stripes to articles advanced by a conveyor, which comprises:

a plurality of work holders having resilient clips for holding the articles projecting laterally from the conveyor;

a pair of plates having laterally aligned first and second top surfaces;

means for tilting the conveyor to move each held article into engagement with the first top surface and then the second top surface against the bias of the resilient clips to hold the articles to ride along both said top surfaces; and

means for flowing a solder stream between said pair of plates to impinge on the articles moving along the top surfaces.

14. A method of applying a stripe of solder to an article, which comprises:

producing a series of longitudinally aligned jets of solder which are spaced close enough to each other to peak, fall back and merge with each other to form a longitudinally flowing elongated narrow solder stream having in a transversal direction a swell of solder projecting from, and extending longitudinally along, the center of the stream; and

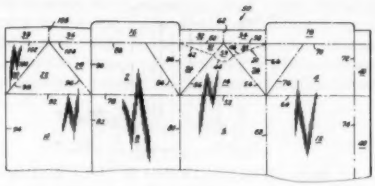
advancing the article in the longitudinal direction relative to the flow of the stream to impinge the longitudinal swell of the solder along the center of the stream against the article.

4,527,732

POURING SPOUT OPENING CONFIGURATION FOR A GABLE TOP OF A CONTAINER

Wesley H. Smith, Rochester, Mich., assignor to International Paper Company, New York, N.Y.

Filed May 10, 1984, Ser. No. 608,771
Int. Cl.³ B65D *5/72*
U.S. Cl. 229—17 G **4 Claims**



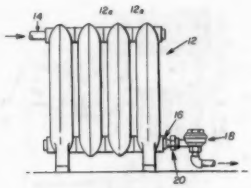
1. An improved pouring spout opening configuration for a gable top of an extended shelf life packaging container constructed of a laminate structure comprising:

a gable top having first and second roof panels inclined toward each other, first and second triangular fold-in panels infolded between said first and second roof panels from opposite ends of said gable top, first, second, third and fourth triangular fold-back panels whereby said first and second fold-back panels being integral with said first triangular fold-in panel along fold lines and being substantially in contact with said roof panels and said third and fourth fold-back panels being integral with said second triangular fold-in panel along fold lines and being substantially in contact with said roof panels, said first and fourth fold-back panels being folded against an underside of said first roof panel and said second and third being folded against the underside of said second roof panel, first and second side rib panels integral with and surmounting said first and second side roof panels respectively, first, second, third and fourth end rib panels whereby said first and second end rib panels being integral with and surmounting said first and second fold-back panels respectively and said third and fourth end rib panels being integral with and surmounting said third and fourth fold-back panels respectively, said first and second end rib panels being folded to lie against each other and said first and second side rib panels and said third and fourth end rib panels being folded to lie against each other and said first and second side rib panels, said end rib panels having a height less than a height of said side rib panels, said rib panels defining a central laminar top rib portion divided longitudinally by a fixed portion and a movable portion, an extendable pouring spout housed in a collapsed condition within said container and defined in part by said first triangular fold-in panel, said first and second fold-back panels, said first and second end rib panels, adjacent portions of said roof panels and said side rib panels, said rib panels being adapted to be sealed by application of heat and pressure to form a liquid-tight seal thereto to bond together contacting thermoplastic surfaces, with said extendable pouring spout having a predetermined shape defined by a continuous perforated line in an underlying paperboard support layer of said laminated structure wherein said continuous perforated line in said paperboard support layer of said laminated structure extends from said fold line between said first fold-back panel and said first roof panel across said first fold-back panel to the fold line between said first fold back panel and said first triangular fold-in panel across said first triangular fold-in panel to the fold line between said first triangular fold-in panel and said second fold-back panel and across the second fold-back panel to the fold line between said second fold-back panel and said second roof panel.

4,527,733
CHECK VALVE

Arthur H. Anderson, Needham, Mass., assignor to Bimax Controls, Inc., Sherborn, Mass.

Filed Jul. 8, 1983, Ser. No. 511,884
Int. Cl.³ F24F *11/00*; **G05D** *23/10*
U.S. Cl. 236—41 **7 Claims**



1. A temperature responsive control system for a steam radiator having a radiator inlet and a radiator outlet and comprising:

housing means comprising a union and defining a housing inlet and a housing outlet, said housing inlet connected for fluid communication with the radiator outlet;

a valve body within said housing means and comprising an end wall, a side wall and a retaining ring portion that together define a valve chamber, said end wall defining a valve inlet opening providing communication between said housing inlet and said chamber and an annular valve seat within said chamber and encircling said valve inlet opening, and said side wall defining a valve outlet opening providing communication between said housing outlet and said chamber, said valve body further comprising an annular skirt portion extending outwardly from said side wall and retained by said union;

a resilient, annular seal means disposed within said valve chamber and encircling said valve inlet opening;

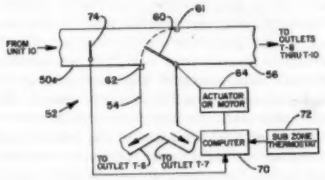
a bi-metalic disc within said valve chamber and having an outer peripheral portion retained by said retaining ring portion of said valve body, said disc being substantially parallel to said valve seat and normally spaced therefrom by a distance greater than the thickness of said annular seal means, and wherein said disc is adapted to respond to a predetermined ambient temperature within said valve chamber by deflecting concavely into said valve chamber and into fluid sealing engagement with one end of said annular seal means, an opposite end thereof being in fluid sealing engagement with said valve seat; and

a thermostatically controlled steam trap connected to said housing outlet.

4,527,734
SUBZONE DIVERTER CONTROL

Roy E. Swain, Fayetteville, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,895
Int. Cl.³ F24F *13/10*
U.S. Cl. 236—49 **5 Claims**



4. Apparatus for satisfying a variable demand in a subzone of a zone controlled in response to conditions determined at a single location comprising:

means for supplying conditioned air to a plurality of air outlets in the zone;

means for sensing a character of the air being supplied to the zone by the means for supplying conditioned air;

means for sensing zone satisfaction at a single location in the zone supplied with conditioned air by said means for supplying conditioned air;

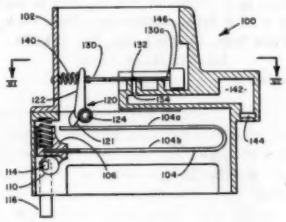
means for sensing satisfaction in a subzone located upstream of said means for sensing zone satisfaction and some of said air outlets; and

means for allocating the conditioned air supplied by said means for supplying conditioned air between said subzone and the air outlets downstream of said subzone and thereby controlling flow to said means for sensing zone satisfaction to cause a change in the flow of conditioned air to the zone.

4,527,735
THERMOSTATIC TRANSDUCER

William E. Clark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 2, 1983, Ser. No. 528,814
Int. Cl.³ G05D *23/08*
U.S. Cl. 236—87 **2 Claims**



1. A bleed thermostat including:

housing means having a bleed port therein;

thermostatically responsive means located in said housing means;

means for providing a temperature set point and positioning said thermostatically responsive means responsive thereto;

means for supplying pressurized air to said bleed thermostat;

bleed plate means in said housing means having an opening therein coacting with said bleed port and positioned in response to said means for providing a temperature set point and the thermostatic response of said thermostatically responsive means to control bleeding of said pressurized air from said bleed thermostat through a flow path controlled by the coaction of said opening and said bleed port; and

differential transformer means for sensing the position of said bleed plate means and thereby the position of said opening and for providing a signal indicative thereof.

4,527,736
ELASTOMERIC RAILWAY-RAIL MOUNT

Hermann Ortwein, Cologne, Fed. Rep. of Germany, assignor to Clouth Gummiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

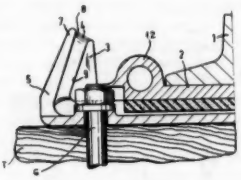
Filed Sep. 27, 1983, Ser. No. 536,174
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239685
Int. Cl.³ E01B *9/62, 11/54, 19/00*
U.S. Cl. 238—283 **9 Claims**

1. A railroad rail assembly comprising:

a metal base plate having along one side thereof a flank

inclined to the vertical and a horizontal portion integral with said flank;

a metal insert plate spaced above said horizontal portion and having along an edge thereof a flank inclined to the vertical and juxtaposed spacedly with said flank of said base plate, said flank of said base plate overhanging said insert plate and having an upper edge lying inwardly of the outline of said insert plate at said edge thereof;



a rail resting on said insert plate and supported thereby in spaced relation from said flanks;

a least one body of elastomeric material received between said insert and said bottom portion and between said flanks with at least part of said body of elastomeric material overhanging said insert plate outwardly of said rail for supporting said insert plate on said base plate; and

said flank of said base plate partically enclosing said body of elastomeric material and said edge of said insert plate.

4,527,737

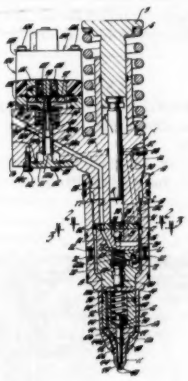
ELECTROMAGNETIC UNIT FUEL INJECTOR WITH DIFFERENTIAL VALVE

John I. Deckard, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1983, Ser. No. 530,549

Int. Cl.³ F02M *55/02, 57/02*

U.S. Cl. 239—89 **3 Claims**



1. An electromagnetic unit fuel injector including a housing means having a pump cylinder means therein; an externally actuated plunger reciprocable in said cylinder means to define therewith a pump chamber open at one end for the discharge of fuel during a pump stroke and for fuel intake during a suction stroke of said plunger; a valve controlled passage means in flow communication at one end with said pump chamber and connectable at its other end to a source of fuel at a suitable supply pressure; said housing means including a valve body having a spray outlet at one end thereof for the discharge of fuel; an injection valve means movable in said valve body to control flow through said spray outlet; a discharge passage means connecting said pump chamber to said spray outlet; a drain passage means connectable at one end to a source of fuel at a suitable supply pressure; a stepped valve guide bore means in said housing means intersecting a portion of each said discharge passage means and said drain passage means and defining an annular valve seat therebetween; a differential valve slidably movable in said guide bore means between an open position and a closed position relative to said valve seat, the larger diameter end of said differential valve defining with a corresponding sized portion of said guide bore means a pressure control chamber, said discharge passage means including branch passage means with a flow control orifice therein opening into said pressure control chamber; and, a solenoid actuated valve controlled passage means for effecting flow communication between said pressure control chamber and said drain passage means.

4,527,738

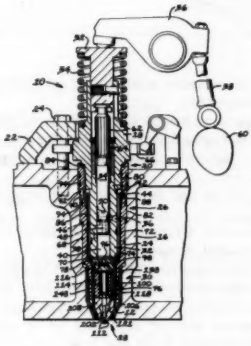
MODULAR UNIT FLUID PUMP-INJECTOR

James L. Martin, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 389,636, Jun. 18, 1982, abandoned. This application Sep. 25, 1984, Ser. No. 654,521

Int. Cl.³ F02M *47/02*

U.S. Cl. 239—90 **6 Claims**



1. A unit fluid pump-injector assembly (**10**) comprising:

a housing (**18**);

a pump assembly (**20**) including a pump cylinder (**32**) and a reciprocable plunger (**34**) therein for developing an injection charge of pressurized fluid;

an encapsulated injector assembly (**28**) for injecting the charge of fluid out of the unit fluid pump-injector assembly (**10**), said encapsulated injector assembly (**28**) including a valve body (**100**) having a valve seat (**110**) and a spray orifice (**112**), a valve (**102**) positioned within the valve body, means (**104**) for resiliently biasing the valve against the valve seat, and a formed case (**106**) encapsulating the valve body and the resilient biasing means and retaining them against separation;

first means (**26**) for removably retaining the pump cylinder (**32**) against the housing (**18**) so that the pump assembly (**20**) may be removed from or assembled to the first retaining means (**26**) without altering the position or arrangement of the encapsulated injector assembly (**28**) relative to the first retaining means, said first retaining means (**26**) including a sleeve-type retainer (**68**) removably fastened to said housing (**18**); and

second means (**30**) for removably retaining the encapsulated injector assembly (**28**) against the first retaining means (**26**) so that the encapsulated injector assembly (**28**) may be removed from or assembled solely as a unit to the first retaining means (**26**) without altering the position or arrangement of the pump assembly (**20**) relative to the first

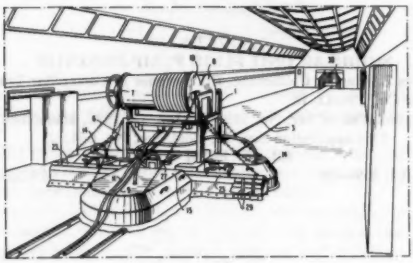
retaining means, said second retaining means (**30**) including a cup-shaped retainer (**148**) removably fastened to said sleeve-type retainer (**68**).

4,527,739

FLOOR CLEANING APPARATUS

Giovanni Parma, Desio, and Francesco Bartolomucci, San Donato Milanese, both of Italy, assignors to Fiat Auto S.p.A. and Midis S.a.s. di Francesco Bartolomucci, both of, Italy

Filed Oct. 21, 1982, Ser. No. 435,802
Claims priority, application Italy, Oct. 27, 1981, 53747/81[U]
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—186 **6 Claims**



1. Apparatus for cleaning a horizontal surfaces by hydrodynamic action, comprising:

a motorised carriage which can be moved back and forth over a said horizontal surface to be cleaned,

a hose having one end connectable to a supply of water under pressure,

a winding drum for said hose, the drum being mounted on said carriage,

first drive means for drivingly rotating the winding drum to pay out and wind in said hose,

two lateral rotary arms rotatably carried by said carriage on respective sides thereof for rotation about vertically disposed axes, said lateral arms being provided with downwardly directed nozzles arranged to be supplied with water under pressure from said hose,

a front rotary arm carried at the front of the carriage for rotation about a vertically disposed axis and provided with downwardly directed nozzles arranged to be supplied with water under pressure from said hose,

two transverse arms extending transversely of the carriage in a direction perpendicular to the direction of movement thereof, said transverse arms being provided with downwardly directed nozzles arranged to be supplied with water under pressure from said hose and the transverse arms being angularly orientatable about their longitudinal axes, and

second drive means for angularly orienting the said transverse arms.

4,527,740

HOSE-END ASPIRATOR SPRAYER

Rudolph M. Gunzel, Jr., Glendale; William J. Wichman, Glendora, and Roy K. Fujitaki, Altadena, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

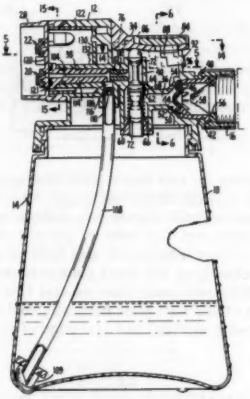
Filed Dec. 16, 1982, Ser. No. 450,273
Int. Cl.³ B05B *7/30*
U.S. Cl. 239—318 **22 Claims**

1. An aspirator sprayer unit adapted to be connected to a hose, for mixing a liquid with pressurized water from the hose and providing a spray of the mixture, comprising:

a container for housing the liquid to be mixed with the water;

a sprayer housing having a connector for attachment to a hose, an inlet passage in fluid communication with the connector to receive pressurized water from a hose attached thereto, and an outlet passage with a motive bore having a first diameter and an eductor bore disposed immediately downstream of said motive bore and having a second diameter larger than said first diameter to thereby create a vacuum when pressurized water flows through said bores;

a metering bore in fluid communication with both said container and said outlet passage for admitting fluid from said container into said outlet passage at a predetermined rate when a vacuum is created in said outlet passage; and



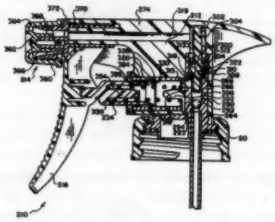
a nozzle means disposed at the end of said outlet passage that is remote from said motive bore, said nozzle being in direct fluid communication with the downstream end of said eductor bore, without any intervening chambers, to thereby maintain the liquid in said nozzle under pressure until the liquid exits from said nozzle.

4,527,741

TRIGGER PUMP SPRAYER

Richard P. Garneau, Davie, Fla., assignor to The AFA Corporation, Hialeah, Fla.

Filed Jun. 13, 1983, Ser. No. 503,907
Int. Cl.³ B05B *9/043*
U.S. Cl. 239—333 **26 Claims**



1. A valve and pumping assembly for use in a trigger sprayer comprising:

a body having a bore therein including a linear passageway having first and second ends with said first end adapted for connection to a source of fluid to be dispensed and a second end adapted for connection to an outlet through which fluid is to dispensed, said passageway having a cylindrical wall, said wall having an opening therethrough for connection of the ends of said passageway to

a pump chamber, said valve and pumping assembly comprising:

first check valve means in said passageway between said first end thereof and said opening for permitting forward flow of fluid from the source but not reverse flow to the source,

second check valve means in said passageway adjacent said second end thereof for permitting forward flow of fluid to said outlet but not reverse flow to said pump chamber, said second check valve means comprising a stationary flexible frusto-conical shaped skirt member having outer marginal edges thereof in engagement with said cylindrical wall of said passageway, and

pumping means comprising a piston received in said pump chamber, a spring in said pump chamber between an inner end thereof and an inner end of said piston for biasing said piston outwardly of said pump character, and trigger means which are pivotally connected to the body, which are engagable with an outer end of said piston and which are hand manipulatable for pushing said piston into said pump chamber against the action of said spring thereby to force fluid in said pumpchamber from said pump chamber through said opening into said bore and past said second check valve means to the outlet, on a outer stroke of said piston, to draw fluid into said pump chamber from the source through said first check valve means.

4,527,742

WASHING APPLIANCE

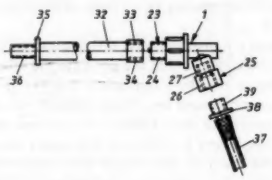
Peter Vogt, Vienna, and Volkwin Hoffelner, St.Andrä-Wördern, both of Austria, assignors to Veropa Dkfm. Peter Vogt KG, Vienna, Austria

Filed Nov. 18, 1983, Ser. No. 553,391

Claims priority, application Austria, Nov. 22, 1982, 4240/82

Int. Cl.[3] **A62C** *31/02*

U.S. Cl. 239—391 **7 Claims**



1. A washing appliance, particularly for washing the body of motor vehicles, comprising a holder having two fittings extending at an angle to each other, said holder being provided with a liquid flow-regulating and shut-off valve, one of said fittings being connected to means for supplying washing liquor, the other fitting serving for a discharge of the washing liquor, a conduit pipe being adapted to be selectively connected to one fitting or the other and being provided at both ends with means for coupling said conduit pipe to mating means provided on one fitting or the other, said conduit pipe being adapted to have a washing implement connected to either end of the conduit pipe.

4,527,743

SPRAY HEAD ASSEMBLY

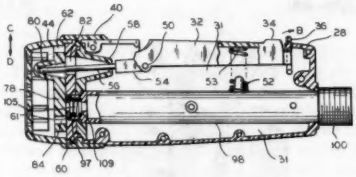
Ralph Ettlinger, Glencoe, and John A. Biela, Niles, both of Ill., assignors to Amco Corporation, Chicago, Ill.

Filed Sep. 19, 1983, Ser. No. 533,606

Int. Cl.[3] **B05B** *9/00*

U.S. Cl. 239—530 **14 Claims**

1. A spray head assembly comprising a housing shell, spring biased actuator lever arm means including a handle having a shaft extending therefrom, means for pivotally mounting said arm means in the housing shell so that said shaft has a see-saw action responsive to a manual movement of said handle, bulkhead means including at least a flexible cone for sealing the front of said housing, said shaft on said lever means passing through said flexible cone in said bulkhead means which enables the actuator lever arm and shaft to see-saw about said pivotal mounting while maintaining a waterproof seal within a spray head compartment, valve means in front of the bulkhead



which is operated between opened and closed positions by the see-sawing of said actuator lever arm means, a pressurized water passageway being opened and closed by said valve means, and means at the output of said spray head for delivering a spray pattern of water flow responsive to an opening of said water passageway.

4,527,744

ELECTROMAGNETICALLY ACTUATABLE VALVE

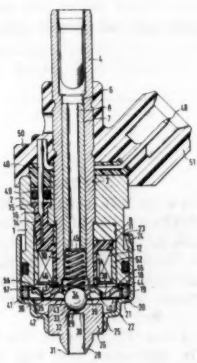
Udo Hafner, Lorch; Rudolf Krauss, Stuttgart, and Werner Langer, Litzendorf, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,268

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230844

Int. Cl.[3] **F16K** *31/06;* **F02M** *51/00*

U.S. Cl. 239—585 **8 Claims**



1. An electromagnetically actuatable fuel injection valve for fuel injection systems of internal combustion engines comprising a valve housing formed of low carbon steel and a core of ferromagnetic material and an armature actuating a valve element secured to said armature and cooperating with a fixed valve seat, a stop face embodied on said valve housing, which armature is attracted toward said stop face embodied on said valve housing, when the magnetic coil is excited, characterized in that said armature and said stop face are both provided with an applied wear-resistant surface coating.

4,527,745

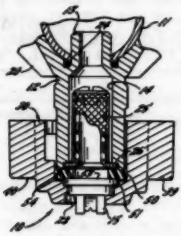
QUICK DISCONNECT FLUID TRANSFER SYSTEM

Ted Butterfield, Naperville; George E. Bird, Hickory Hills; Gary A. Paulsen, Geneva, and Edward J. O'Brien, Barrington, all of Ill., assignors to Spraying Systems Co., Wheaton, Ill.

Continuation-in-part of Ser. No. 382,912, May 28, 1982, abandoned. This application May 23, 1983, Ser. No. 496,968

Int. Cl.[3] B05B *1/00;* F16L *21/02*

U.S. Cl. 239—600 31 Claims



1. A fluid transfer system comprising the combination of

a cap member having a first fluid transfer member supported therein, a second fluid transfer member having an end positionable in axially spaced fluid communication with an end of said first fluid transfer member, said cap member and second fluid transfer member having cooperating lugs and slots for locking said cap and second members together when the cap member is placed on said second member and rotated relative thereto,

resilient annular gasket disposed between said second member and cap member and surrounding the ends of said first and second members, and

said cap and second members forming (1) an annular space on one side of an outer peripheral edge portion of said gasket, and (2) an annular sealing end pressing against the other side of said outer peripheral edge portion of said gasket so that said sealing end bends said outer peripheral edge portion of said gasket into said annular space to effect a liquid-tight seal on both sides of said gasket.

4,527,746

PROCESS FOR PREPARING GRANULES OF WATER-INSOLUBLE SOLIDS

Hans-Heinz Mölls, Leverkusen; Vaclav Kaspar, Cologne; Bernhard Vosteen, Cologne; Georg Dehmel, Cologne; Reinhold Hörnle, Cologne, and Karlheinz Wolf, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,806

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212965

Int. Cl.[3] B02C *19/12*

U.S. Cl. 241—23 2 Claims

1. A process for preparing granules of water-insoluble solids said solids comprising a water-insoluble pigment which comprises comminuting a non-thixotropic press or filter cake of such solids by introducing said press or filter cake via a rotating driver to a dicing cylinder of a dicing apparatus and therein dicing said solids and drying the so diced solids in a dryer while subjecting the same to a rolling motion such that said solids only come in contact with parts of said dryer which are rigidly connected to one another.

4,527,747

METHOD AND VIBRATORY CHUTE FOR TREATING GOODS

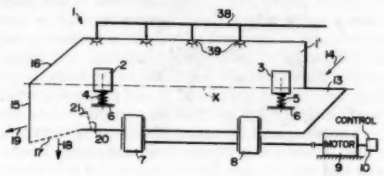
Wolfgang Scharmer, Darmstadt-Arheilgen; Heinz Saettler, Gerolsheim, and Eugen Schlag, Darmstadt, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,461

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206544

Int. Cl.[3] B02C *17/14*

U.S. Cl. 241—26 18 Claims



1. A method for treating goods in a vibratory chute having a longitudinal axis, a center of gravity line, and a main conveying direction extending substantially in the same direction as said longitudinal axis, comprising the following steps:

(a) imparting vibrating force components to said chute for applying a force resultant (R, R') to cause said chute to vibrate, said vibrating force components extending substantially perpendicularly to and across said main conveying direction;

(b) selecting the size of these vibrating force components relative to each other so that an effective direction of said force resultant (R, R') of these force components extends at a definite spacing (s, s') from said center of gravity line (S, S');

(c) causing a non-symmetric distribution of the goods in the vibrating chute so that the goods in the vibrating chute are moving across the longitudinal axis (x) of the chute from a lower movement reversing zone (**27**) to an upper movement reversing zone (**26**) and vice versa; and

(d) assuring larger k_v-values at said upper movement reversing zone than at said lower movement reversing zone, wherein said k_v-values are defined as the ratio of a vertical acceleration component of said goods to a gravity vector, whereby the goods are exposed to higher vertical accelerations in said upper movement reversing zone than in said lower movement reversing zone.

4,527,748

TUBULAR MILL FOR GRINDING NATURAL AND SYNTHETIC RAW MATERIALS, PARTICULARLY FOR THE CEMENT INDUSTRY

Paolo Catani, Bergamo, Italy, assignor to ITALCEMENTI Fabbriche Riunite Cemento S.p.A., Bergamo, Italy

Filed Jul. 26, 1983, Ser. No. 517,435

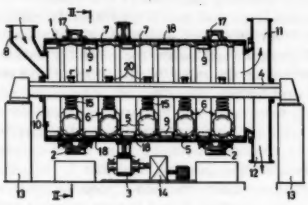
Claims priority, application Italy, Dec. 28, 1982, 25011 A/82

Int. Cl.[3] B02C *4/32*

U.S. Cl. 241—57 10 Claims

1. A tubular mill for grinding natural and synthetic raw material, said mill comprising a horizontally disposed rotary cylindrical drum, said drum having an inner and outer wall, at least one grinding roller means being disposed radially within said drum and supported by a fixed shaft which extends along the axis of rotation of said drum, said roller means being idle and able to rotate by friction within an annular guide, said annular guide being rigid with the inner wall of said drum, said roller means being provided with means for adjusting pressure of said roller means exerted against said annular guide, and means for selectively adjustably positioning the vertical axis of

said roller means relative to the vertical axis of said drum normal to its axis of rotation whereby said roller means may be



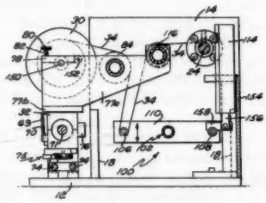
positioned to act in a zone in which material tends to be deposited.

4,527,749

INTERFEROMETRIC FIBER OPTIC HYDROPHONE WINDING MACHINE

William G. Matthews, Baltic, and Todd E. Whitaker, New London, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1984, Ser. No. 578,738
Int. Cl.[3] B65H *81/06, 54/04*
U.S. Cl. 242—7.15 **4 Claims**



1. An apparatus for winding optical fiber on a compliant, cylindrical mandrel so as to form an interferometric optical hydrophone, said apparatus comprising:

a rigid horizontal, rectangular base plate having longitudinal and transverse axes;

a first vertical support plate, fixedly attached to said base plate parallel to one of the shorter ends thereof, said first vertical support plate having the axis orthogonal to the plane of said first support plate aligned parallel to said longitudinal axis of said base plate;

a second vertical support plate, spaced a preselected distance away from said first vertical support plate and fixedly attached to said base plate, said second vertical support plate being generally parallel to and coaxial with said orthogonal axis of said first support plate such that said base plate is divided into a first mounting area lying between said first and second vertical supports, a second mounting area adjacent to and contiguous with said first mounting area and a third mounting area adjacent to said second vertical support plate on the side thereof facing away from said first vertical support plate;

traversing means, extending parallel to said longitudinal axis of said base plate and mounted to said second mounting area, for providing controlled helical payout of said optical fiber onto said compliant, cylindrical mandrel by controllably traversing the distance between said first and second vertical plates, said traversing means further comprising a traversing mechanism, capable of converting rotary motion from said drive means to linear travel, said mechanism traversing forward and back along a shaft extending parallel to the common axis of said first and second vertical plates, and having a traverse speed varying means as part thereof, an optical fiber dispensing stand, fixedly mounted atop said traversing mechanism, for providing a dispensing platform for said optical fiber, a reel, wound with a preselected length of said optical fiber, said reel being rotatably attached to said optical fiber dispensing stand, and tension adjusting means, attached to said reel, for adjustably varying fiber tension as desired;

tension sensing means, mounted between said first and second vertical plates, for sensing and indicating the amount of tension in said optical fiber comprising a rectangular frame, having a parallel pair of equal length longer members and a parallel pair of equal length shorter members oriented orthogonally thereto and being rigidly attached to form said frame, said frame being pivotably attached at the midpoint of each shorter member thereof, one each of said shorter members attaching to said first and second vertical supports, for rotatably responding to increases or decreases in said optical fiber tension; a force gage, moveably attached to said frame, for responding to said frame rotation by indicating the fiber load thereon; and a gage support means, fixedly attached to said first mounting area, for rigidly holding said force gage at a preselected location midway between said first and second vertical support plates;

drive means, rigidly attached to said base plate on said third mounting area, for providing a common source of controllable motive power to said traversing means and said compliant, cylindrical mandrel; and

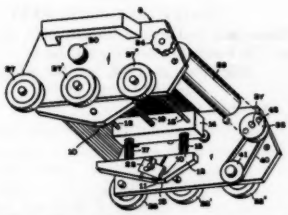
control means, connected to said drive means and said traversing means, for selectively controlling fiber payout rate, tension, lay angle and total length.

4,527,750

APPARATUS FOR CUTTING OUT STRIPS FROM FLEXIBLE WEBS

Lars Juntti, Poppovägen 19, S-82500 Iggesund, Sweden

PCT No. PCT/SE82/00320, § 371 Date Jun. 9, 1983, § 102(e) Date Jun. 9, 1983, PCT Pub. No. WO83/01507, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 7, 1982, Ser. No. 511,168
Claims priority, application Sweden, Oct. 13, 1981, 8106046
Int. Cl.[3] B65H *35/02;* **B26D** *5/20*
U.S. Cl. 242—56 R **8 Claims**



1. Apparatus for cutting out strips from a web wound to the shape of a cylindrical roll, comprising a carrier, at least two spaced-apart cutting members mounted on said carrier for cutting out said strips between each other, a rotatable core for winding up a web strip cut out by said cutting members, contact members mounted on the carrier for exerting a pressure against an outermost web layer so as to firmly hold said layer in place when moving the apparatus axially along the cylindrical surface of the roll, and resilient means for providing a relative resilient mobility between said cutting members and said contact members toward or away from the outermost web layer so as to permit the application of the apparatus against

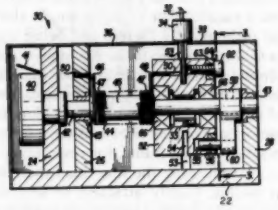
said cylindrical surface of rolls irrespective of varying diameters thereof.

4,527,751

UNIVERSAL DANCER SPEED CONTROL

Edward G. Grosz, Sodus Point, and F. John Herrington, Holcomb, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,930
Int. Cl.[3] B65H *25/04, 59/38*
U.S. Cl. 242—75.51 **11 Claims**



11. A universal dancer speed control for a web processing machine having at least one electric drive motor comprising:

at least two rollers mounted for rotation about stationary axes and at least one roller mounted for rotation about an axis carried by a movably mounted dancer arm;

a cable connected to said dancer arm at a preselected distance from said movable mount;

means for adjusting the speed of said drive motor in accordance with the movement of said dancer arm, including a potentiometer having a shaft mounted for rotation and connected to said cable and a reel for said cable;

a variable lost motion connecting device connected to said shaft to rotate it in a first direction in accordance with a variable movement of said cable, said lost motion connecting device comprising said reel having a variable length first arcuate slot, a pin engaging said slot and connected to said shaft for rotation therewith, the slot being positioned to engage the pin at one end of said slot and thus to rotate the shaft and the potentiometer;

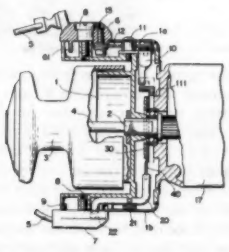
resilient biasing means connected to said lost motion connecting device to rotate it in a second opposite direction.

4,527,752

FISHING SPINNING REEL

Kenji Maruyama, and Konin Sazaki, both of Fuchu, Japan, assignors to Ryobi Limited, Fuchu, Japan

Filed Jan. 26, 1984, Ser. No. 574,289
Int. Cl.[3] A01K *89/01*
U.S. Cl. 242—84.2 G **12 Claims**



1. A fishing spinning reel, comprising:

a main reel body including a central boss formed on a front of said reel body;

a rotor supported by said main body and provided with a pair of arms formed on a periphery of said rotor at diametrically opposing positions of said rotor;

a bail arm lever and means for rotatably mounting said bail arm lever on one of said arms of said rotor;

a bail arm cam and means for rotatably mounting said bail arm cam on the other of said arms of said rotor;

a bail arm having opposite ends, one of said opposite ends being secured to said bail arm lever and the other of said opposite ends being secured to said bail arm cam;

said bail arm being rotatable from a line-casting position to an intermediate position, and then from said intermediate position to a line-rewinding position upon rotation of a rotatable member of said fishing spinning reel;

first means for rotating said bail arm from said line-casting position to said intermediate position upon rotation of said rotatable member of said fishing reel;

said first means comprising a first kick boss mounted for relative rotation on the central boss of said reel body and means for biasing said first kick boss in the counter direction of rotation of said rotor, and a first kick lever mounted for rotation on one of said arms of said rotor, said first kick lever having one end which is engageable with an inner recess formed on the corresponding one of said bail arm lever and said bail arm cam, and said first kick lever having another end which is adapted to contact with said first kick boss when said rotor is rotated while said bail arm is at its line-casting position;

second means for successively rotating said bail arm from said intermediate position of said bail arm to said line-rewinding position of said bail arm upon successive rotation of said rotatable member of said fishing spinning reel;

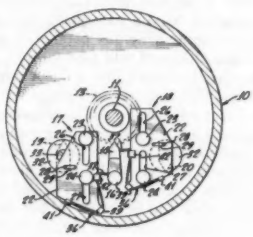
said second means comprising a second kick boss mounted for reciprocal movement with respect to said first kick boss upon rotation thereof, and a second kick lever swingably mounted on the other one of said arms of said rotor, said second kick lever having one end which is interconnected with the other one of said bail arm lever and said bail arm cam, and said second kick lever having another end which is adapted to contact with said second kick boss after said bail arm is rotated to said intermediate position thereof for rotating said bail arm from said intermediate position to said line-rewinding position.

4,527,753

DUAL-CONTROL FLY-FISHING REEL

Leon Jones, 18192 Gothard St., Huntington Beach, Calif. 92648

Continuation of Ser. No. 404,031, Aug. 2, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 670,116
Int. Cl.[3] A01K *89/02*
U.S. Cl. 242—84.51 R **19 Claims**



1. A fishing reel, which comprises:

(a) a housing,

(b) a spool having a clicker gear mounted fixedly and coaxially thereon, said spool being mounted rotatably in said housing,

(c) a pawl associated with said gear,
(d) means to pivotally connect said pawl to said housing,
(e) spring means associated with said pawl to resist pivoting thereof in a predetermined direction and thus cause said pawl to resist turning of said clicker gear and said spool in a predetermined direction, and
(f) means to effect large changes in the moment arm between the pivot axis of said pawl and the region where said spring means is associated with said pawl, to thus effect large changes in the pivoting and turning resistances stated in clause (e).

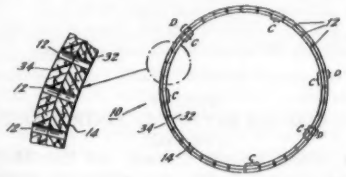
8. A fly-fishing reel, which comprises:
(a) a housing,
(b) a spool having a clicker gear mounted fixedly and coaxially thereon, said spool being mounted rotatably in said housing,
(c) a pawl,
(d) means to pivotally connect said pawl to said housing, said pawl extending radially of said gear, and having an inner end engaged with said gear, the point of pivotal connection of said pawl to said housing being spaced away from said gear, said pawl having opposite side surfaces near which springs may shift toward and away from said gear, to change the moment arms tending to resist pivoting of said pawl in one direction or the other,
(e) first and second springs disposed on opposite sides of said pawl and respectively near said opposite side surfaces,
(f) first and second means, independent of each other, to move said respective springs toward and away from said gear, and
(g) means provided in association with each of said springs to preload the same and also to prevent each of the associated springs from following said pawl when said spool is rotating in a predetermined direction, the relationships being such that only one of said springs is operatively associated with said pawl when said spool rotates in one direction, and only the other of said springs is operatively associated with said pawl when said spool rotates in the opposite direction.

4,527,754

NON-THERMAL EXPANDING SPOOL FOR CARBON FIBER OXIDATION

Robert J. Flynn, Greer, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1983, Ser. No. 526,667
Int. Cl.³ B65H *75/02*
U.S. Cl. 242—118.1 **7 Claims**



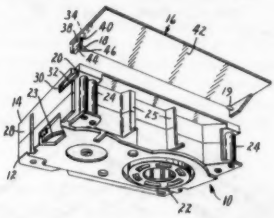
1. A non-thermal expanding spool for use in carbon fiber oxidation, or for the like purposes, the spool comprising:
a hollow tube comprised of a carbon fiber composite with a high temperature thermosetting resin impregnated in it, said resin being selected from the group consisting of polyimides, phenolics, epoxy/phenolic blends, polyphenylenes, polyphenylene oxides, polyphenylene sulfides, polysulfamides, and polysulfones;
the tube having openings through it, which are arrayed along the length of the tube and around the circumference of the tube, for enabling controlled passage of oxidizing gas through the openings.

4,527,755

HINGED VISOR-TYPE DOOR FOR TAPE CASSETTE

Robert M. Rood, Woodbury, and James J. Wulfing, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1983, Ser. No. 542,414
Int. Cl.³ G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—199 **9 Claims**



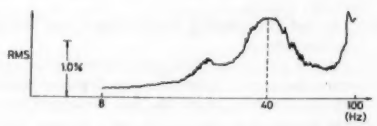
1. Tape cassette comprising a housing, an elongated visor-type door, at each end of which is an ear extending orthogonally to the inner face of the door, at least one ear having first and second edges which intersect at substantially right angles, a pin hinging each ear to the housing, and a spring mechanism which rests against said first edge when the door is closed and against said second edge while the door is open and is under flexure when resting against the intersection of those edges while the door is partially open, wherein the improvement comprises
a resilient free-standing finger which is said spring mechanism.

4,527,756

CASSETTE TAPE MACHINE

Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 335,035, Dec. 28, 1981, Pat. No. 4,413,793.
This application Jun. 27, 1983, Ser. No. 508,396
Claims priority, application Japan, Dec. 26, 1980, 55-186650; Dec. 29, 1980, 55-187922
Int. Cl.³ G11B *15/24, 15/32;* **B65H** *49/02*
U.S. Cl. 242—68.3 **2 Claims**



1. In a cassette tape machine having a rotatable reel shaft unit with a plurality of engagement projections on its outer periphery having contact surfaces for engaging a reel in a cassette tape whereby said reel rotates said shaft unit in a supply direction, the improvement characterized in that said shaft unit comprises:
a shaft member;
a ring-shaped member disposed around said shaft member and axially movable with respect to said shaft member, said ring-shaped member being biased for radial expansion and including said plurality of engagement projections, said engagement projections having resiliently inclined contact surfaces whereby abutment of said contact surfaces by said reel will urge said projections radially inwardly with respect to said shaft unit; and
a retaining member for limiting radial expansion of said ring-shaped member and having a plurality of slits

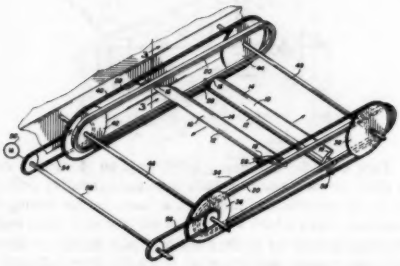
through which said engagement projections contact said reel.

4,527,757

LIFT GENERATING MECHANISM FOR AN AIRCRAFT

Gilbert R. Gonzales, 677 Creed Ave., Las Cruces, N. Mex. 88005, and John A. La Monica, Jr., 1607 N. Euclid, Tucson, Ariz. 85719

Filed Jun. 30, 1981, Ser. No. 279,184
Int. Cl.[3] B64C *39/00, 27/00*
U.S. Cl. 244—20 7 Claims



1. A lift generating mechanism for an aircraft comprising:

a. a plurality of airfoils each having first and second end surfaces, first and second side surfaces and a centerline extending between the first and second side surfaces, the airfoil section lying between the first end surface and the centerline being a mirror image of the airfoil section lying between the second end surface and the centerline;

b. means coupled to the aircraft and to the first and second side surfaces of each airfoil for driving each airfoil in a single rotational direction through an oval path including a first horizontal path segment and a second horizontal path segment positioned below the first horizontal path segment, the oval path further including first and second transition regions wherein said drive means includes

(i) a first chain forming a first oval path around first and second sprocket wheels;

(ii) a second chain forming a second oval path around third and fourth sprocket wheels;

(iii) a first axle coupling together the first and third sprocket wheels;

(iv) a second axle coupling together the second and fourth sprocket wheels;

(v) said first and second oval paths formed by the first and second chains each including a first displaced horizontal path segment lying above the first horizontal path segment traversed by the airfoils and a second displaced horizontal path segment lying below the second horizontal path segment traversed by the airfoils;

c. means coupled to each airfoil for deflecting each airfoil in a first rotational direction as it passes through the first transition region such that each airfoil presents a positive angle of incidence as it traverses the first horizontal path segment wherein the first end surface of each airfoil functions as a leading edge and for deflecting each airfoil in a second rotational direction as it passes through the second transition region such that each airfoil presents a positive angle of incidence as it traverses the second horizontal path segment wherein the second end surface of each airfoil functions as a leading edge;

d. an oval shaped track coupled to the aircraft and including a roller unit coupled to each airfoil for guiding the airfoils around the oval path, said roller unit including

(i) an axle;

(ii) a roller rotatably coupled to the axle and contacting the oval shaped track; and

(iii) a link rigidly coupled at one end to the axle and pivotally coupled at the opposite end to one of the chains;

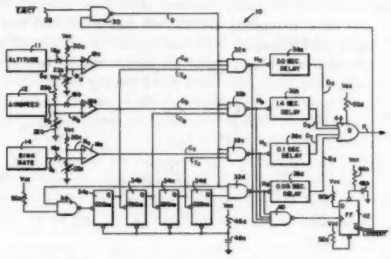
whereby each airfoil generates positive lift as it transits both the first and second horizontal path segments of the oval path.

4,527,758

DEPLOYMENT SEQUENCE MODE SELECTION SYSTEM FOR AIRCRAFT EJECTION SEAT

Peter Ayoub, Bryn Mawr, and Alan Cantor, Ivyland, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 12, 1983, Ser. No. 531,097
Int. Cl.[3] B64D *17/58*
U.S. Cl. 244—150 5 Claims



1. A system for selecting the release time of a parachute after ejection from an aircraft comprising:

sensor means for producing sensor signals indicative of altitude, airspeed and sink rate of the aircraft immediately prior to ejection; and

processor means responsive to said sensor signals for providing a parachute release signal a predetermined delay time after ejection, the time being selected in accordance with the following criteria:

t_1 to t_2 when $S_a < R_a$, $S_b < R_b$, and $S_c > Rc$, or

t_2 when $S_a < R_a$, $S_b < R_b$, and $S_c < R_c$, or

t_3 when $S_a < R_a$ and $S_b > R_b$, or

t_4 when $S_a > R_a$,

where

t_1, t_2, t_3 and t_4 = delay times of respectively increasing durations,

S_a, S_b and S_c = sensor signals indicative of the aircraft altitude, airspeed and sink rate, respectively, and

R_a, R_b and R_c = minimum altitude, airspeed and sink rate, respectively, for optimium recovery envelopes.

4,527,759

UNITARY CLIP FOR RETAINING CONTROL LINES ON A FLANGE

Karlheinz Dorner, Bergisch Gladbach, and Kurt Mohrholz, Rösrath-Forsbach, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

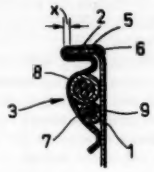
Filed Jun. 9, 1983, Ser. No. 502,813
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 3223751
Int. Cl.[3] F16L *3/08*
U.S. Cl. 248—73 4 Claims

1. A self-locking clip for retaining control lines between a mounting plate and a flange formed to extend from said plate comprising:

means defining an open-ended support channel for accepting the insertion of said flange, wherein one side of said channel is formed by an upper support arm having a tab element formed on the end thereof to curve towards said

open end of said channel for contacting a corner formed between said flange and said plate; and

means defining a biasing arm extending from said channel defining means for contacting the underside of said plate,



when said flange is inserted, to cant said channel with respect to said flange and to force said tab against said corner and for defining a void between itself and the underside of said plate to retain said control lines.

4,527,760

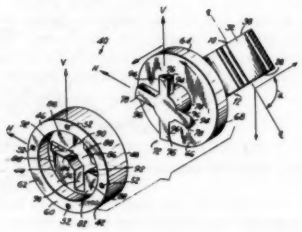
ADJUSTABLE CLIP SYSTEM

Frank Salacuse, New York, N.Y., assignor to Super Glue Corporation, Ridgewood, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,966

Int. Cl.³ B65D *35/56*

U.S. Cl. 248—108 **4 Claims**



1. A multipurpose clip-on system including a device capable of releasably holding objects, in combination comprising:

a body forming a compartment defined by a side wall and a front wall secured to said side wall,

means for connecting said body to a generally vertical surface opposed and substantially parallel to said front wall,

a snap-clamp device having opposed clamp means for holding objects in either vertical or horizontal alignments of said clamp means,

mounting member means in abutting rotational relationship with said front wall and connected to said snap-clamp device, said mounting member means being for releasably connecting said snap-clamp device to said body,

fastening means connected to said mounting member means, and

means associated with said front wall and said compartment for receiving and locking said fastening means, said fastening means being for positioning said mounting member means with said means for receiving and locking and further for positioning said mounting means and said snap-clamp device to said body in a locked position in selected vertical and horizontal alignments of said clamp means, said mounting member means including a mounting member having opposed first and second surfaces and wherein said front wall includes opposed inner and outer surfaces, said first surface being in rotational abutting relationship with said outer surface, said fastening means including a shaft having opposed ends with one of said ends connected to and extending substantially perpendicular from said first surface of said mounting member and two pairs of oppositely positioned locking arms connected to the other of said ends and extending substantially at right angles relative to said shaft, one of said pair of arms being substantially at right angles relative to the other of said pair of arms, said means for receiving and locking including said front wall forming a central passage substantially normal to said inner and outer surfaces and further forming two pairs of oppositely positioned slots normal to said inner and outer surfaces connected to said central passage, said central passage and said slots being adapted to receive said two pairs of arms and said central passage being further adapted to position said shaft, each of said arms including a tapered surface having an edge extending substantially at right angles to said shaft, each said edge being rotationally aligned with the other edges.

4,527,761

DEVICE FOR THE SUPPORTING OF HORIZONTAL, THERMALLY LOADED CONTAINERS

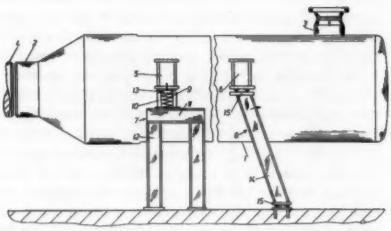
Konrad Nassauer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,596

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303752

Int. Cl.³ F22B *37/24*

U.S. Cl. 248—128 **4 Claims**



1. Device for supporting a horizontal, thermally loaded container, comprising: first and second bearings and first and second support brackets, said container resting on said bearings through said support brackets; said bearings being independently spaced from each other; said first support bracket being in said first bearing and guided for vertical and horizontal displacement; said second bearing comprising hinged supports inclined relative to the longitudinal axis of the container and pivotable in direction of the longitudinal axis of the containe., said hinged supports having joints at two ends and being substantially free of deformation, extension of said container in horizontal direction from thermal effects moving said hinged supports toward vertical direction and lifting thereby the container, the longitudinal axis of said container remaining horizontal after extension of said container from thermal effects and being lifted only by a predetermined amount; inclination of said hinged supports being dependent on vertical displacement corresponding to lifting of said container.

4,527,762

REAR PANEL AND BRACKET MOUNTING FOR A FAN COIL UNIT

Richard J. Duell, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 24, 1983, Ser. No. 507,606

Int. Cl.³ A47G *29/00*

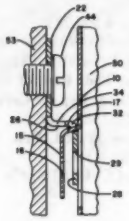
U.S. Cl. 248—222.1 **7 Claims**

1. An assembly for mounting a heat transfer unit to either a wall or a ceiling of a space to be conditioned which comprises:

a planar fastening panel forming a portion of the heat trans-

fer unit, said panel having at least one slot defining at least one integral tab having a tab inclined portion angled from the panel and having a relatively narrow width and a tab body connected to the tab inclined portion and having a relatively greater width, said tab body being generally in a plane spaced from and adjacent said slot and parallel with a plane defined by the fastening panel; and

at least one mounting bracket including means for securing the bracket to either a wall or the ceiling of the space to be conditioned, said mounting bracket including a base portion secured to the wall or ceiling, a connecting portion extending from and angled to the base portion, said connecting portion defining a mounting opening including a narrow portion and a wide portion and a retainer portion extending from the connecting portion in a direction parallel to and away from the base portion, said narrow



portion being nearest said retainer portion and said wide portion being nearest said base portion and said mounting opening being sized to allow the tab body to pass through the wide portion of the opening and the inclined portion to fit through the narrow portion of the opening when said tab body and said retainer portion extend in the same direction whereby upon assembly of the fastening panel to the mounting bracket the fastening panel is secured relative to the mounting bracket with the inclined portion of the tab located in the narrow portion of the mounting opening and the tab body adjacent the retainer portion, and wherein said tab body defines a tab opening, and the retainer portion of the mounting bracket defines a fastener opening, and further comprising a fastener extending through the fastener opening in the mounting bracket and tab opening to secure the fastening panel to the mounting bracket.

4,527,763

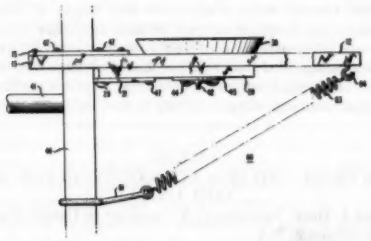
DETACHABLE TOOL AND PAINT CAN PLATFORM FOR LADDER

Nicholas Woytowich, 542 Springfield Rd., Linden, N.J. 07036

Filed May 7, 1984, Ser. No. 607,810

Int. Cl.³ E06C *7/14*

U.S. Cl. 248—238 **20 Claims**



1. A detachable platform of the type which is detachably engagable with a side rail of a ladder having inward and outward sides, to provide a substantially horizontal support surface, the detachable platform comprising:

a platform member having a first surface for forming the substantially horizontal support surface and a second surface arranged substantially parallel to said first surface;

a tensile coupling member coupled to said platform member and arranged to communicate with the inward side of the side rail of the ladder;

a compression coupling member having a slide surface for communicating slidably with said second surface of said platform member, said compression coupling member being arranged to cooperate with said tensile coupling member and communicate with the outward side of the side rail of the ladder; and

locking means communicating with said platform member and said compression coupling member for locking said platform member and said compression coupling member to one another at positions relative to one another corresponding to a distance between the inward and outward sides of the side rail of the ladder.

4,527,764

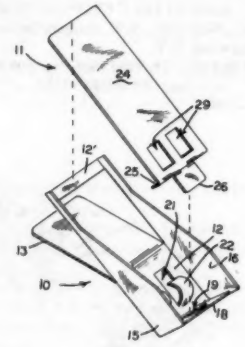
DRY SOAP DISPENSER

Vernon C. Krause, 480 John Ward Rd., Marietta, Ga. 30064

Filed Oct. 17, 1983, Ser. No. 542,593

Int. Cl.³ A47K *5/08*

U.S. Cl. 248—309.1 **2 Claims**



1. A soap bar dispenser comprising a support strap adapted to be mounted atop a generally horizontal support surface; an inclined ramp supported by said support strap; said ramp having a raised island; a raised stop located adjacent a lower end of said ramp; and a slide having an opening through which said island may project; said slide being supported upon said ramp for movement between a soap bar holding position with a lower end of said slide located at a relatively low position with respect to said stop and a soap bar dispensing position with said lower slide end located at a relatively high position with respect to said stop.

4,527,765

DEVICE FOR LOCKING PIVOTALLY MOUNTED CORNER POSTS OF LOADING PLATFORMS

Willi Dorpmund, and Volker Kreienbrink, both of Elze, Fed. Rep. of Germany, assignors to Graaff, Kommanditgesellschaft, Elze, Fed. Rep. of Germany

Filed May 26, 1981, Ser. No. 267,186

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020064

Int. Cl.³ A47B *91/00*

U.S. Cl. 248—346 **10 Claims**

1. A folding flat comprising:

a base plate having at least one corner,

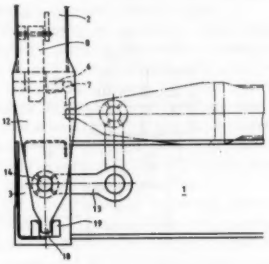
a support means fixed to the base plate in the region of the base plate corner,

a corner post movable with respect to the base plate between an erect condition generally perpendicular to the base plate and a collapsed condition generally parallel to the base plate,

a pin projecting from one of the support means and corner

post and a cooperating socket for accommodating the pin being located in the other of the support means and corner post, the pin and socket being interengaged when the corner post is erect and being separable in a vertical direction when the base plate is in horizontal orientation,

lever means secured to the corner post and pivotally mounted on the base plate at a point horizontally spaced from the corner post, whereby rotation of the corner post, from its erect condition toward its collapsed condition, about the pivot point of the lever means causes relative



substantially vertical movement between the pin and socket to separate them, and

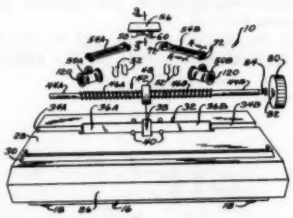
resilient means arranged to be stressed during the substantially vertical movement of the corner post which results in interengagement of the pin and socket, during the final movement of the corner post to its erect condition, whereby the resilient means tends to aid vertical movement of the corner post for separation of the pin and socket upon the initial movement of the corner post from its erect condition toward its collapsed condition.

4,527,766

VIDEO DISPLAY TILT APPARATUS

Horst M. Krenz, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jun. 1, 1983, Ser. No. 500,125
Int. Cl.³ A47G *29/00*
U.S. Cl. 248—371 **14 Claims**



1. An apparatus for supporting a video display over a range of selected vertical tilt angles for improved viewing of said video display, said apparatus comprising:

a base upon which a forward portion of said video display is positioned for the support thereof, said base having first and second lateral facing portions and a linear groove in an upper surface thereof extending between said facing lateral portions;

a shaft having a first right-hand threaded portion and a second left-hand threaded portion along the length thereof, said shaft positioned in the linear groove of said base and free to rotate therein;

a support member upon which an aft portion of said video display is positioned for the support thereof;

first and second links pivotally and rotationally coupled at respective first ends thereof to said first right-hand and second left-hand threaded portions of said shaft, respectively, and pivotally coupled at respective second ends thereof to said support member, wherein said support member is pivotally coupled to said shaft and is free to assume a continuous range of tilt angles relative to the upper surface of said base; and

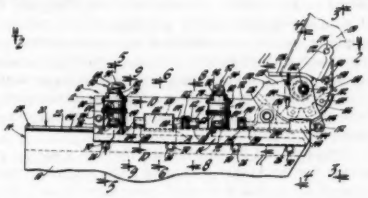
control means fixedly positioned adjacent to one of the lateral facing portions of said base and on one end of said shaft for the rotational displacement of said shaft wherein rotation of said shaft in a first direction causes the displacement of the first ends of said first and second links in respective first and second opposite directions along said shaft in lowering said support member and the aft portion of said video display positioned thereon and rotation of said shaft in a second direction causes the displacement of the first ends of said first and second links in respective second and first opposite directions along said shaft in raising said support member and the aft portion of said video display positioned thereon.

4,527,767

SEAT ADJUSTER

Richard W. A. Rees, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1983, Ser. No. 539,274
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—419 **7 Claims**



1. A seat slide structure for supporting a vehicle occupant seat on a vehicle for adjustment relative thereto comprising, in combination, a pair of elongate relatively movable upper and lower tracks, each track being formed of a pair of complementary opposite hand track members,

the track members of the upper track each including a web, a lateral flange and a reversely bent upwardly opening leg, the webs of the track members being secured to each other and the flanges extending oppositely of each other to provide the base wall of the one track,

the track members of the lower track each including a web and a reversely bent downwardly opening leg,

each leg of each track member including a bight portion and a terminal flange, the legs of the upper track members being interfitted with respective legs of the lower track members to locate the legs in pairs with the bight portions of the legs of the upper track members juxtaposed to the respective terminal flanges of the legs of the lower track member,

a generally T-shaped spacer having the leg thereof fitted between and secured to the webs of the lower track members to provide the lower track, the head of the spacer fitting between the base wall of the upper track and the bight portions of the legs of the lower track and normally engaging the juxtaposed bight portions and flanges to block sliding movement of the upper track relative to the spacer and lower track,

the head of the spacer including slots located between each bight portion and the base wall,

said slots being closed upon movement of the upper track downwardly relative to the lower track upon occupancy of the seat to disengage the engaged bight portions and terminal

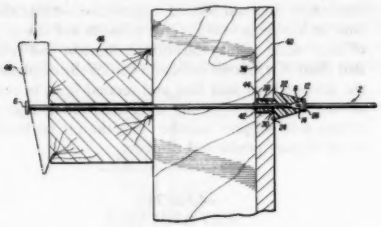
flanges and permit relative movement of the upper track relative to the spacer and lower track.

4,527,768

TIE ROD WITH SELF-SECURING END

Andrew S. Cohen, 13000 SW. 92nd Ave., Apt. B211, Miami, Fla. 33176

Filed Sep. 9, 1983, Ser. No. 530,721
Int. Cl.³ E04G *17/08*
U.S. Cl. 249—214 **8 Claims**



1. A self-securing tie rod used with panel forms for concrete construction including

an elongated rod,

securing means slidably mounted on said elongated rod,

said securing means having gripping means, wherein said gripping means is a cylindrical extension having resilient irregularly shaped protrusions on an outer circumferential surface thereof for gripping a smooth interior wall of an aperture formed in a panel in a force-fit relationship therebetween to prevent undesired vertical movement of said elongated rod, and

said elongated rod having formed thereon a wedge portion means for lockingly engaging said securing means to prevent undesired horizontal movement of said elongated rod.

4,527,769

APPARATUS FOR MOVING A CONTROLLED MEMBER TO A PREDETERMINED POSITION

Clarence H. Stogner, and David J. Koerner, both of Cincinnati, Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed Oct. 3, 1983, Ser. No. 538,663
Int. Cl.³ F16K *31/145*
U.S. Cl. 251—14 **22 Claims**

20. An actuator comprising:

(a) a housing;

(b) a fluid pressure member reciprocally movable between first and second positions along a rectilinear path within said housing;

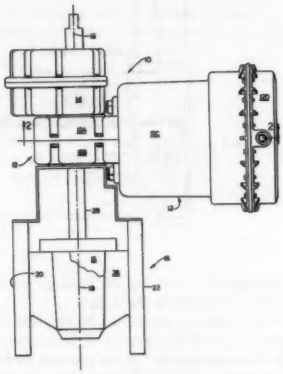
(c) a spring having linear force-displacement characteristics and operative to bias said fluid pressure member toward said first rectilinear position, said spring being displaced by said fluid pressure member as said fluid pressure member is moved toward said second rectilinear position;

(d) means for introducing and exhausting a pressurized fluid into and out of said housing said fluid pressure member being selectively moved toward the second rectilinear position against the bias of said spring upon introduction of said pressurized fluid, said spring being operative to return said fluid pressure member to said first rectilinear position upon exhausting of said pressurized fluid from said housing;

(e) a shaft rotatable between first and second rotatable positions about a rotational axis, said shaft being adapted for transmitting torque to a controlled member;

(f) a crank arm rigidly secured to said shaft and rotatable therewith, said crank arm including a pin; and

(g) a link pivotally attached relative to both said fluid pressure member and said rotatable shaft to transmit the biasing force of the spring along a line of action, said link having a slot for receiving said pin with said pin being movable within said slot, said link being operative to move the crank arm and the shaft to a predetermined position through contact with the pin when said fluid pressure member is in its first position while permitting rotation of the crank arm and the shaft between the first and second rotatable positions independently of movement of the



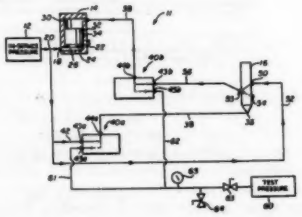
pressure member whenever said fluid pressure member is in said second rectilinear position, the link-shaft attachment being offset relative to the rotational axis so that the link-shaft attachment travels along an arcuate path as the shaft is rotated between the first and second angular positions, the perpendicular distance between the rotational axis and the line of action being coordinated with the force displacement characteristics of the spring so as to produce a maximum spring generated torque intermediate the first and second rotational positions of the shaft.

4,527,770

IN-SERVICE TEST VALVE

Ralph W. Vanderburg, Longview, Tex., assignor to Axelson, Inc., Longview, Tex.

Division of Ser. No. 407,336, Aug. 12, 1982, Pat. No. 4,480,653.
This application Jul. 6, 1984, Ser. No. 628,639
Int. Cl.³ F16K *31/363*
U.S. Cl. 251—26 **7 Claims**



4. A safety-relief system for monitoring a source having an in-service pressure and relieving said source when said in-service pressure exceeds a predetermined maximum, which comprises:

a relief valve including a valve element having an effective area arranged to be acted on by said in-service pressure, said valve element being operated by a dome piston posi-

tioned in a dome and having an effective area larger than the effective area of said valve element;

a control sensor including a sensor inlet, an in-service inlet, a control port, and a vent port, said control port being connected to said dome, said control sensor being adapted to receive in-service pressure at said sensor inlet and normally to supply in-service pressure from said in-service inlet to said control port, and said control sensor being adapted, when the pressure at said sensor inlet exceeds said predetermined maximum, to communicate said control port with said vent port and block said in-service inlet, thereby causing said relief valve to open;

a first test valve having an in-service inlet connected to receive in-service pressure, an outlet connected to said sensor inlet of said control sensor, and a test inlet connected to a test pressure source, said first test valve normally supplying in-service pressure from said first test valve in-service inlet to said first test valve outlet, and said first test valve being operated by test pressure to block said first test valve in-service inlet and supply test pressure to said first test valve outlet;

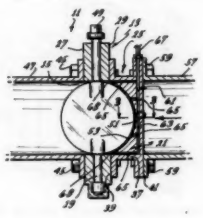
and a second test valve having an in-service inlet connected to receive in-service pressure from said control port of said control sensor, an outlet connected to said dome, and a test inlet connected to said test pressure source, said second test valve normally supplying in-service pressure from said second test valve in-service inlet to said second test valve outlet, and said second test valve being operated by test pressure to block said second test valve in-service inlet and supply test pressure to said second test valve outlet.

4,527,771

BUTTERFLY VALVE PROTECTOR

Arthur R. Yeary, Seven Twin Lakes Cir., Corona del Mar, Calif. 92625

Filed Dec. 7, 1983, Ser. No. 558,924
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—118 **20 Claims**



1. A valve comprising:

a valve body having a passage extending therethrough through which a fluid stream can flow;

a butterfly valve element;

means for pivotably mounting the valve element in the passage of the valve body for pivotal movement between an open position and a second position, said valve element having an edge which faces generally upstream in said passage in said open position;

a guard;

means for mounting said guard in said passage of the valve body and closely adjacent said edge of the valve element in said open position, said guard being adapted to protect said edge of the valve element from the fluid stream without blocking the passage; and

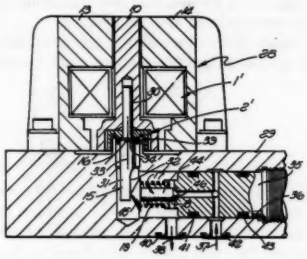
passage means at least partially in said guard for conveying a flowable substance through the guard to a location closely adjacent said edge of the valve element in said open position.

4,527,772

MODULATING CONTROL VALVE

Berhanu Kebede, Inglewood, and Marion L. George, Northridge, both of Calif., assignors to International Telephone & Telegraph Corp., New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,361
Int. Cl.³ F16K *31/10*
U.S. Cl. 251—138 **8 Claims**



1. A modulating control valve comprising in combination:

a body;

first and second ports extending into said body;

a passageway located inside said body, said passageway having an input end connected from said first port, said first port being an inlet port;

a valve seat at an output end of said passageway;

a poppet slidable in said body from a position sealing said valve seat shut to a position spaced therefrom, said poppet controlling communication between said passageway and said second port, said second port being an outlet port, said poppet having a stem and a head connected to said stem at a first end thereof; and

an electromagnetically operable flapper mounted in said body, said flapper including a flat portion engageable with said head to reciprocate said stem by such engagement, said reciprocation causing said poppet to close and to open in direct proportion to the excitation applied to said electromagnetically operable flapper, said head being conical about an axis approximately normal to said flat portion, said conical head including a flared end interfacing with said first end of said stem, said flared end for retaining a coil compression spring intermediate said body and said conical head and being concentric with said stem and said conical head further including a pointed end biased against said flat portion by said coil compression spring, said flapper being elongate and having a longitudinal axis and being rotatable through an arc about an axis approximately midway along the length of said flapper and normal to said longitudinal axis and said poppet slidable in a translational trajectory of said passageway wherein said rotatable flapper and said translational poppet provide a smooth modulating control employing said conical head pointed end as an interface.

4,527,773

SHUT-OFF VALVE WITH A SEAL FORMED FROM AN ELASTIC STRIP

Rudolf Müller, Merzenich, and Hermann J. Stolberg, Düren, both of Fed. Rep. of Germany, assignors to Hermann Rappold & Co. GbmH, Düren, Fed. Rep. of Germany

Filed Feb. 23, 1983, Ser. No. 468,995
Claims priority. application Fed. Rep. of Germany, Mar. 12, 1982, 3208906
Int. Cl.³ F16K *1/226*
U.S. Cl. 251—306 **5 Claims**

1. A polygonal shut-off valve, particularly for use in a pipeline for conveying cases, and comprising:

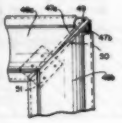
a valve casing;

a valve member mounted for movement between a valve open position and a valve closed position;

seal means, mounted on at least one of said valve casing and said valve member, for forming a seal with a sealing surface at least when said valve member is in said valve closed position;

said seal means including a polygonal frame member formed by plural straight sections each having two legs extending in a direction toward the position of said sealing surface when said seal is formed, said two legs being spaced and defining therebetween an open channel;

said seal means further including a polygonal seal member formed by plural straight sections each formed from a



respective substantially flat elastic strip which is deformed to include two leg portions which are positioned between and freely and elastically urged toward respective inner surfaces of said legs of said frame member and a bent portion which connects said two leg portions and which projects outwardly of said channel for sealing contact with said sealing surface, said seal member having therein elongated openings; and

guide pins fixed to said frame member and extending through said elongated openings, such that said seal member is retained in said frame member by said guide pins and is movable in said direction with respect to said frame member by the extent of said elongated openings.

4,527,774

SPHERICAL VALVE LOCK-VALVE SPRING RETAINER ASSEMBLY TO MINIMIZE VALVE GUIDE SIDE LOADS

Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Filed Jun. 9, 1983, Ser. No. 502,575
Int. Cl.[3] F16K *31/44*
U.S. Cl. 251—337 **2 Claims**

1. A poppet valve having a stem, in combination with means on the valve stem end portion away from the valve for mounting a valve spring retainer wherein said retainer is free to tilt out of perpendicularity with regard to the lengthwise axis of the valve stem end portion, locking means mounted on the stem end away from the valve, said locking means having a curved portion engaging a matingly configured surface on the retainer for holding the valve spring retainer in operative

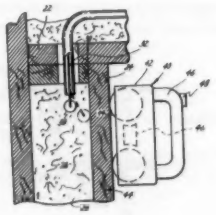
position and allowing the retainer to tilt relative to said locking means and about the axis of the valve stem.

4,527,775

APPARATUS FOR INSTALLING CONDUIT

Thomas Flowers, 1069 E. York, Flint, Mich. 48505

Filed May 4, 1983, Ser. No. 491,154
Int. Cl.[3] E21C *29/16*
U.S. Cl. 254—134.3 FT **2 Claims**



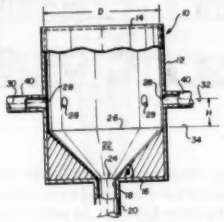
1. Apparatus for installing conduit in a confined space behind a wall between points of access to the confined space which comprises a tape having magnetically responsive roller means at one end which is insertable into the confined space via one point of access, a drum disposed exteriorly of the confined space near said one point of access, the other end of said tape being coiled onto said drum, said drum being operable to withdraw the tape from the confined space via said one point of access, a magnet for drawing the magnetically responsive roller means at said one end of said tape toward said wall and for moving said tape, via magnetic attraction of said magnetically responsive roller means, through the confined space to another point of access, said roller means at said one end of said tape rolling against said wall during movement by said magnet, conduit being attached to said tape after the latter has been drawn to said another point of access, the conduit being drawn through the confined space to said one point of access by withdrawing said tape from the confined space via said one point of access.

4,527,776

METHOD OF CONTROLLING SUBSTANTIALLY EQUAL DISTRIBUTION OF PARTICULATES FROM A MULTI-OUTLET DISTRIBUTOR AND AN ARTICLE CONSTRUCTED ACCORDING TO THE METHOD

John H. Scheel, Ashland, Ky., assignor to Armco, Inc., Middletown, Ohio

Filed Dec. 19, 1983, Ser. No. 563,192
Int. Cl.³ B56G 53/34
U.S. Cl. 266—44 9 Claims



1. The method of controlling substantially equal distribution of particulates from a multioutlet distributor in a conveying system conveying a supply of particulates to at least a first receiver having a plurality of inlets for conveying pulverized coal or the like to a blast furnace having a plurality of inlets, comprising the steps of:

(a) providing a quantity of particulates to be conveyed through said system;

(b) providing a moving fluid for conveying said particulates through said system, said fluid having a velocity at least equal to the saltation velocity;

(c) selecting a distributor deviation of from about 0% to less than 4%;

(d) providing a single distributor having a chamber permitting unchanneled flow of particulates and having a plurality of generally equiangularly disposed outlets wherein said distributor is sized according to the equation:

$$\text{Distributor deviation} = 0.123519 + 0.012624\,X - 0.056494\,Y + 0.001738145\,Z - 0.024970\,XY + 0.008364605\,XZ + 0.09806324\,YZ + 0.015736\,X^2 + 0.023791\,Y^2 + 0.018989\,Z^2,$$

where $X = \frac{H - 19.125}{18}$,

$$Y = \frac{D - 17.25}{6.0}, \text{ and } Z = \frac{V - 80}{20}$$

And where H is the distance between said distributor outlets and the top of an insert in said distributor, D is the internal diameter of said distributor and V is the velocity of said moving fluid;

(e) connecting each of said outlets with one of said inlets of said at least first receiver; and,

(f) operating said system.

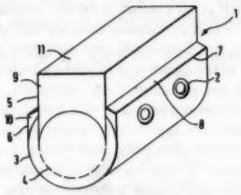
4,527,777

FLAME-CUTTING MACHINE

Horst K. Lotz, Kiefernweg 13, 6200 Wiesbaden-Delkenheim, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,856
Claims priority, application European Pat. Off., Nov. 9, 1982, 82108388.8; Fed. Rep. of Germany, Mar. 29, 1983, 8309246[U]
Int. Cl.³ B23K 7/02
U.S. Cl. 266—50 20 Claims

1. In a flame-cutting machine having at least one displacable cutting torch for dividing hot and cold billets, bloom and slab rods in continuous casting installations during the casting operation, particularly with long casting periods and thus increased thermal stresses, where the flame-cutting machine has a double jacket all around it through which a cooling medium flows and through which bearing eyes for shafts of rotors as well as through tubes for machine parts going out or penetrating into the body of the machine are welded into the double jacket, the improvement comprising the double jacket



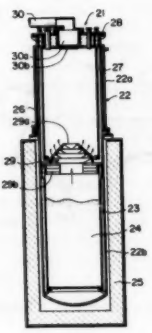
(1) having two U-shaped shells (3, 4) arranged concentrically spaced apart from one another, with branches (5) of the inner shell (4) extending further upward than the branches (6) of the outer shell (3), a lengthwise closing plate (8) extending from the end edge (7) of the outer shell (3) to the inner shell (4) and end closing plates (9, 10) on the end sides.

4,527,778

APPARATUS FOR PRODUCTION OF REFRACTORY METAL FROM A CHLORIDE THEREOF

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,405
Claims priority, application Japan, Apr. 6, 1982, 57-56041
Int. Cl.³ C21B 7/00
U.S. Cl. 266—171 5 Claims



1. Apparatus for production of refractory metal from a chloride thereof, comprising a conversion assembly and a purification assembly separated from each other; said conversion assembly comprising: an elongated vertical cylindrical member with an open top and a closed bottom, another cylindrical member open at each end but with a grid plate detachably supported at a bottom thereof, said cylindrical members forming coaxially arranged outer and inner vessels, respectively, an annular top cover at the upper ends of said inner and outer vessels, a closure joined over a central bore of said top cover, mechanical means for detachably and airtightly joining said top cover to the upper end of said inner vessel, mechanical means for detachably and airtightly joining said top cover to the upper end of said outer vessel, furnace means surrounding the outer vessel, tube means extending through said closure for feeding raw chloride into the inner vessel, another tube which is open in the outer vessel at the bottom thereof and extends

along a wall thereof outwards for discharging fluids from said outer vessel, and means for evacuation and introduction of inert gas; said purification assembly comprising: an elongated vertical cylindrical retort which comprises an upper half coolable with a water jacket arranged thereon and a lower half heatable with a furnace means therearound, and a cylindrical member of substantially the same construction as the inner vessel, said cylindrical member being in a coaxial relation inside the upper half of said retort, a further annular top cover at the upper ends of said cylindrical member and of said retort, mechanical means for detachably and airtightly joining said further top cover to the upper end of said cylindrical member, mechanical means for detachably and airtightly joining said further top cover to the upper end of said retort, said top cover being of substantially the same construction as that of the top cover of the conversion assembly, and having a central bore joinable with a closure to which a duct is connected for degassing said retort, said mechanical means for joining the further top cover and retort of the purification assembly being compatible with the mechanical means for joining the top cover and outer vessel of the conversion assembly.

4,527,779

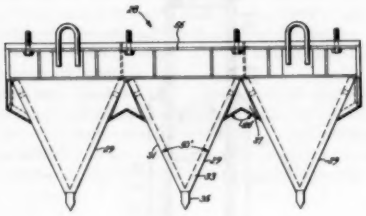
METAL RECOVERY COMPRESSION MECHANISM

David J. Roth, Bolivar, Ohio; Lawrence R. Culler, Terre Haute, and Ralph D. Heifner, Rockville, both of Ind., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 505,727, Jun. 20, 1983,. This application Sep. 30, 1983, Ser. No. 537,657

Int. Cl.³ C22B *21/00*

U.S. Cl. 266—227 **13 Claims**



1. An improved dross compression assembly comprising, in combination,

a tray having at least one trough;

a compatible compression head for cooperation with the tray;

compression drive means for mounting the head in cooperative relation with the tray for movement toward and away from the tray;

said tray having a four sided trough defined by opposite pairs of sides, at least one pair of which is inclined, and at least one pair of sides including metal flow openings and a longitudinal slot between one pair of the sides; and

said head also including opposite pairs of inclined sides forming a wedge compatible with the tray sides, said head further including a longitudinal probe extension parallel to the tray slot and aligned to project toward the slot, said probe having a lateral dimension equal to or less than the width dimension of the slot, said probe dimensioned to project toward the slot from the apex of the associated sides for a distance greater than the width of the slot.

4,527,780

PISTON LOCKING FOR GAS SPRINGS

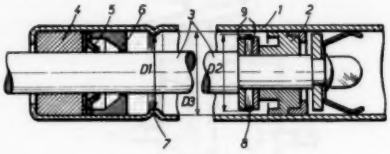
René Bich, Maisons-Laffitte, France, assignor to Societe J.G. Allinquant, Gentilly, France

Filed Feb. 26, 1982, Ser. No. 352,554

Claims priority, application France, Feb. 27, 1981, 81 03968

Int. Cl.³ F16F *5/00*

U.S. Cl. 267—64.12 **8 Claims**



1. In a gas spring which includes a cylinder filled with pressure gas and a piston fitted endwise of a rod which is gastightly guided through a cylinder bottom and which is lockable in its extreme extension position out of said cylinder against untimely retraction into said cylinder, the improvement wherein the cylinder wall includes a localized constriction protruding inwardly therefrom adjacent said bottom thereof, and wherein a resiliently yieldable, contractile snap ring is fitted on said piston rod, which snap ring has at rest an external diameter slightly larger than the internal diameter of said constriction, said snap ring being heat sensitive such that its external diameter at rest will increase with a decrease in its temperature and decrease with an increase in its temperature, said constriction and snap ring being designed for mutual cam type engagement upon said snap ring overreaching said constriction at the end of the extension stroke of said rod out of said cylinder, whereby said snap ring is caused by engagement with said constriction to yieldingly contract on passing over the latter and thereafter resiliently expand back to its rest diameter once beyond said constriction, said constriction and snap ring being thereby interlocked to arrest retraction of said rod into said cylinder.

4,527,781

PNEUMATIC VEHICLE SUSPENSION UNIT WITH AIR SLEEVE GUIDE

James M. Pees, and Jerry L. Neubauer, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

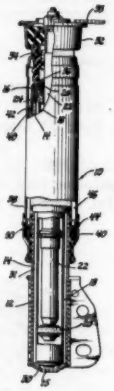
Filed Aug. 8, 1983, Ser. No. 521,062

Int. Cl.³ F16F *9/08*

U.S. Cl. 267—64.24 **4 Claims**

1. A pneumatic suspension having a hydraulic damper with a cylinder tube having a hydraulic fluid therein, a piston mounted for reciprocating movement in said cylinder tube, a piston rod attached to said piston and extending axially in said cylinder tube and through one end thereof, an outer tube disposed around said cylinder tube, a cylindrical dust tube operatively connected to an outer end portion of said piston rod and extending outwardly of and around a portion of said outer tube and having an outer annular side, a cylindrical air sleeve of elastomeric material having an inner end operatively connected to said outer tube and an outer end operatively connected to said dust tube to form an air adjustable lift spring, first retainer means for sealingly securing the inner end of said sleeve to said outer tube, said sleeve extending alongside of said outer tube and reversely curved between the ends thereof and further extending upwardly around an outer side of said dust tube, second retainer means sealingly securing an upper end of said sleeve to said dust tube, an annular air sleeve guide disposed within the confines of said air sleeve and around the lower end of said dust tube, said guide having a continuous and

smooth contact surface to contact said sleeve to reduce wear of said sleeve by said dust tube, and fastener means for releasably



fastenting said air sleeve guide ring to the lower end portion of said dust tube.

4,527,782

SPRING CRAMP

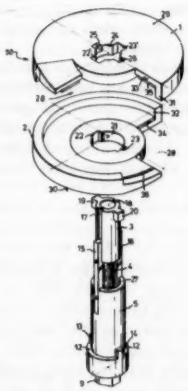
Horst Klann, Terra Wohnpark 12, D-7730 Villingen-Schwenningen 24, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,517

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304321

Int. Cl.³ F16F *1/12*

U.S. Cl. 267—177 **15 Claims**



1. A spring cramp for large helical springs comprising first and second loose disc-shaped pressure plates, each of said plates having a facing contact surface providing a spring turn abutment and each of said plates having a central hole, an internally threaded tube engageable through the hole in said first plate, a guide tube engageable through the hole in said second plate, a threaded spindle journalled in said guide tube and threadably engaged with said internally threaded tube, said guide tube having a radially outwardly projecting shoulder, radially interengageable first projection and groove formation defined between said guide tube and said second plate preventing rotation of said guide tube relative to said second plate, and a second radially interengageable projection and groove formation defined between said guide tube and said threaded tube preventing rotation of said guide tube relative to said threaded tube.

4,527,783

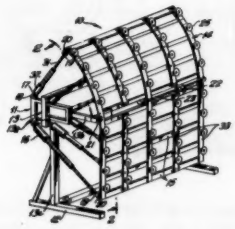
UNIVERSAL CONTOURED PARTS HOLDING FIXTURE

George A. Collora, Holbrook, and Ronald C. Braun, West Islip, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,818

Int. Cl.³ B25B *11/00*

U.S. Cl. 269—21 **12 Claims**



1. An apparatus for holding contoured work-pieces in a pre-determined contour while work is being performed on said work-pieces, said apparatus comprising:

(i) a base;

(ii) a spring metal frame attached to said base at one or more points for forming a contoured support plane for said work-pieces, said frame being composed of a plurality of flexible bands, said flexible bands comprising a plurality of flexible supporting bands each interconnected with a plurality of flexible connecting bands;

(iii) a plurality of linear actuator members positioned at said points on said base and attached to one or more of said flexible connecting bands for deforming said spring metal frame, said actuator members including means for pulling and pushing said flexible bands so as to form concave and convex contours;

(iv) computer means for activating said linear actuator members for contouring said support plane of said spring metal frame to concave and convex contours; and

(v) constraining means for holding said contoured work-pieces in said support plane, said constraining means comprising a plurality of spaced vacuum cups mounted on any of said flexible bands.

4,527,784

ASSEMBLY APPARATUS FOR MAKING FRAMES OR PANELS

Bernard Schwab, Essert, Switzerland, assignor to Andre' Gueissaz et Cie, S.A., Vaud, Switzerland

PCT No. PCT/CH82/00033, § 371 Date Oct. 28, 1982, § 102(e) Date Oct. 28, 1982, PCT Pub. No. WO82/03041, PCT Pub. Date Sep. 16, 1982

PCT Filed Mar. 4, 1982, Ser. No. 438,895

Claims priority, application Switzerland, Mar. 5, 1981, 1491/81

Int. Cl.³ B25B *1/20*

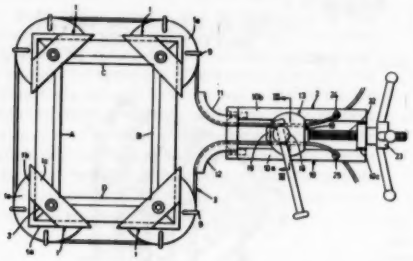
U.S. Cl. 269—42 **7 Claims**

1. An apparatus for assembling a plurality of side members to form a closed frame or panel in which adjacent side members are connected to one another to form corners, said frame or panel having the same number of corners as side members, said apparatus comprising:

a plurality of angles, each angle embracing one of said corners, a guide means being provided in each of said angles;

a cable having a central section, first and second ends, and two transitional sections connecting each of said ends to said central section, said central section of said cable passing within said guide means of each of said angles;

a tightener having an elongated rectangular frame provided at one of its ends with two convergent force equilizing slideways, a movable clamp for firmly grasping said ends of said cable mounted on a slide, said slide being longitudinally slidably mounted on said frame, and an operating



screw actuating said slide and clamp such that said cable is tightened about said angles by being drawn through said slideways when said operating screw is actuated relative to the frame in the longitudinal direction, said frame being constructed with at least two sides and said clamp being made up of a clamp body provided with guide means and mounted on said slide so that said clamp is able to slide longitudinally between the sides of said frame, and said clamp further having a jaw connected to said clamp body by a tightening screw.

4,527,785

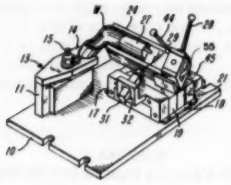
MACHINE TOOL APPARATUS

Vaughn Kearns, Larue, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 383,484, Jun. 1, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 599,598

Int. Cl.³ B25B *1/08*

U.S. Cl. 269—71 **21 Claims**



1. In a tool for performing successive machining operations on a held part, means defining a reference surface, a fixture for holding the part, a mount for said fixture adjustable in plural senses whereby a previously machined surface on a held part may be applied to the reference surface properly to position the part for a succeeding machine operation, said mount being supported for tilting and for raising and lowering movements relative to said means defining a reference surface, and a single means operable to lock said mount in an adjusted position, said means defining a reference surface and said mount being supported on a common base, said mount including a vertically reciprocable post terminating at an upper end thereof in a table mounting said fixture, clamp members relatively slidable on said base, and a split ball member freely rotatable between said clamp members having said post reciprocable therein and said ball member being compressible by and between said clamp members, said clamp members being actuated by said single means.

4,527,786

WORKBENCH

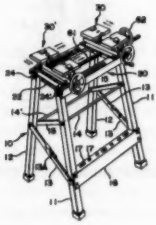
Wen C. Hsu, No. 12, Road 18, Industrial District, Taichung, Taiwan

Filed Dec. 22, 1982, Ser. No. 452,209

Claims priority, application Taiwan, Jul. 30, 1982, 7124242

Int. Cl.³ B25B *1/00*

U.S. Cl. 269—154 **4 Claims**



1. A work bench, comprising:

a supporting structure;

a rectangular frame comprising a first pair of parallel angle members each having an upper planar surface and an elongated slot therein and a second pair of parallel angle members fixedly connected to end portions of each of said first pair of angle members, said rectangular frame being pivotally supported on top of said supporting structure;

a first vise assembly fixedly mounted on said rectangular frame and substantially above and along one of said second pair of angle members;

a second vise assembly slidably and detachably mounted on said rectangular frame and being arranged in parallel to said first vise assembly, and being operable with a first leadscrew having a crank handle for selectively moving said second vise assembly over and along said first pair of angle members towards and away from said first vise assembly;

said first and second vise assemblies each comprising a fixed jaw, a movable jaw to correspond with said fixed jaw, and an elongated base on which said fixed jaw is fixedly mounted and said movable jaw is slidably mounted; said movable jaw being operable with a second screw-threaded rod having a crank handle for moving said movable jaw towards and away from said fixed jaw along the longitudinal axis of said elongated base;

each of said movable jaw also being capable of swivelling around a bolt with which each of said movable jaw is slidably mounted on said elongated base, said bolt having one end integrally formed into a block provided with a screw threaded hole to mesh with said screw-threaded rod; and

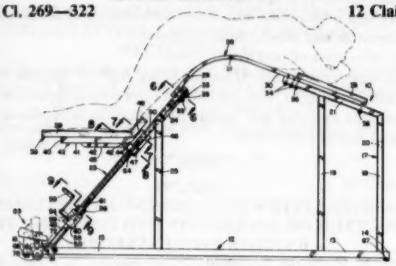
the elongated base of said second vise assembly being slidably and detachably mounted on said first pair of angle members with bolts passing through said elongated slots in said first pair of angle members, said bolts being adaped to selectively allow said elongated base of said second vise assembly to slide along said first pair of angle members or to fasten said elongated base of said second vise assembly on said first pair of angle members.

4,527,787

X-RAY TABLE

John S. Collis, Jr., 29001 Cedar Rd., Cleveland, Ohio 44124

Filed May 31, 1983, Ser. No. 499,538
Int. Cl.[3] A61G *13/00*
U.S. Cl. 269—322 12 Claims



1. A medical table comprising:

a bottom support frame having a front and a rear;

a front support frame resting on the bottom support frame and attached thereto, the front support comprising a pair of first upright frame members supported on the first of the bottom support frame, a pair of second upright frame members extending generally parallel to the front upright frame members and spaced behind the front upright frame members, and a pair of front top frame members each supported on top of one of the first upright frame members and one of the second upright frame members;

a rear support frame spaced from the front support frame, the rear support frame also resting on the bottom support frame and attached thereto, there being a substantial clearance between the front support frame and the rear support frame; and

a radiolucent top panel supported at a front end by the front support frame and at a rear end by the rear support frame, the front end of the top panel being supported by attachment to the front top frame members, the panel being generally convex in shape with an intermediate raised portion, thetop of the front support frame being connected to the top of the rear support frame only by the radiolucent top panel without any radiopaque connection therebetween, whereby the presence of radiopaque material between the front support frame and the rear support frame is avoided.

5. A medical table comprising:

a bottom support frame having a front and a rear;

a front support frame resting on the bottom support frame and attached thereto;

rear support frame spaced from the front support frame, the rear support frame also resting on the bottom support frame and attached thereto, the rear support fram comprising a pair of rear frame members extending from the rear of the bottom support frame at an acute angle with respect thereto, and a pair of upright frame members in front of the rear frame members, an upper portion of each of the rear frame members being supported on top of one of the upright frame members, there being a substantial clearance between the front support frame and the rear support frame; and

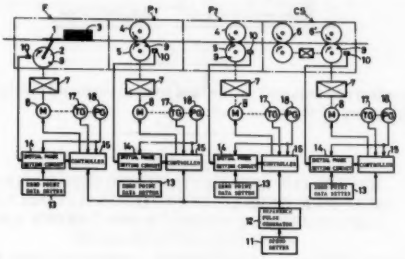
a radiolucent top panel supported at a front end by the front support frame and at a rear end by the rear support frame, the rear end of the top panel being supported by attachment to the rear frame members, the panel being generally convex in shape with an intermediate raised portion, the top of the front support frame being connected to the top of the rear support frame only by the radiolucent top panel without any radiopaque connection therebetween, whereby the presence of radiopaque material between the front support frame and the rear support frame is avoided.

4,527,788

PRINTER-SLOTTER WITH SPEED VARIABLE MOTOR CONTROL

Itsuro Masuda, Higashiosaka, Japan, assignor to Hamada Printing Press Mfg. Co., Ltd., Osaka, Japan

Filed Aug. 1, 1984, Ser. No. 636,661
Claims priority, application Japan, May 26, 1984, 59-107253
Int. Cl.[3] B41F *13/56*
U.S. Cl. 270—21.1 1 Claim



1. A printer-slotter having a blank feed unit, at least one printing unit and a creaser/slotter unit for printing, creasing and slotting the blanks fed one after another, said units each having a rotating member and arranged along the flow of the blanks and so as to be separable from each other, said printer-slotter comprising:

reference signal generating means for generating a reference signal and giving it to each of said units,

each of said units comprising:

a speed variable motor for driving said rotating member;

a zero point sensor for detecting a zero point marked on said rotating member;

initial phase setting means for setting the initial phase of said rotating member of each unit on the basis of data obtained beforehand and in response to the signal from said zero point sensor;

speed detecting means for detecting the speed of said speed variable motor and generating a speed signal proportional to its speed;

phase detecting means for detecting the phase of said rotating member and generating a phase signal proportional to its phase; and

control means for controlling the speed of said speed variable motor so that said speed signal and said phase signal will be equal to the signal from said reference signal generating means.

4,527,789

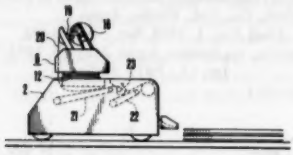
WEB LAYING MACHINE

Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Hiroshima, Japan

Filed Jul. 2, 1984, Ser. No. 627,016
Claims priority, application Japan, Jul. 13, 1983, 58-128110
Int. Cl.[3] B65H *29/46*
U.S. Cl. 270—31 4 Claims

1. A web laying machine including a laying unit having a horizontal base and a pair of support arms for receiving a roll of stock material, the pair of support arms being rotatable through 180° with respect to the horizontal base; characterized in that the pair of support arms are mounted on a pivotable casing having a bottom in which a slit of a given length is formed extending toward the axis of a pivot shaft around which the pivotable casing is rotatable, and further including a motor mounting plate having a pivotting motor mounted thereon and slidable over the slit, a drive shaft arranged to be driven by the motor and extending downwardly from the lower surface of the motor mounting plate to extend through the slit, gear means such as a sprocket wheel or a gear which

is fixedly mounted on the lower end of the drive shaft, and meshing means in the form of a cap-shaped chain gear or a



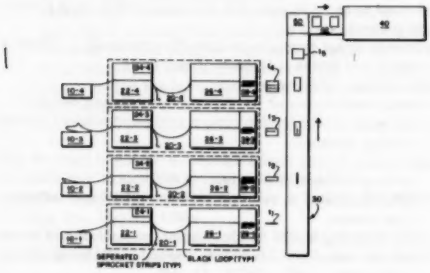
toothed rod mounted on the base so as to surround one-half the periphery of the pivot shaft.

4,527,790

APPARATUS AND METHOD FOR SEPARATING MULTIPLE WEBS OF DOCUMENTS HAVING THE CAPABILITY FOR ORDERLY SHUT-DOWN AND RE-START OF OPERATION

Peter N. Piotroski, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,686
Int. Cl.[3] B65H *41/00*
U.S. Cl. 270—58 **6 Claims**



1. A system for orderly shut-down and restart of a multi-web inserter system of the type wherein control information is imprinted on the sprocket strips of control forms included in a first web, said control information is scanned and said sprocket strips removed from said web prior to separation of said web into discrete forms, comprising:

(a) first web module means for;

receiving said first web;

scanning said sprocket strips for said control information;

removing said sprocket strips;

storing and retransmitting said control information to supervisory control means for the control of said inserter means in accordance with said control information;

separating said web into said discrete forms;

forming accumulations of said forms;

feeding said accumulations for further operations by said system;

(b) a second web module means for receiving a second web;

separating said second web into second discrete forms;

forming second accumulations of said second discrete forms,

feeding said second accumulations synchronously with said first accumulations for further operations by said system;

(c) supervisory control means, including non-volatile memory means, for receiving said retransmitted control information and generating signals for control of said inserter system in accordance therewith;

said supervisory control means being responsive to a shut-down signal to complete operations in accordance with said retransmitted control information associated with control forms which have been separated from said first web;

receive from said first web module means said control information associated with unseparated control forms from which said sprocket strips have been removed;

store said information associated with said unseparated control forms in said non-volatile memory;

halt operation of said system; and,

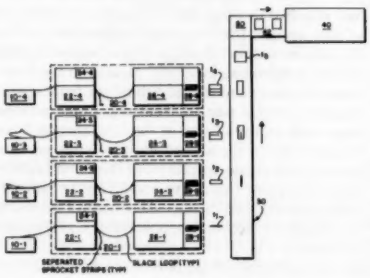
said supervisory control means being further responsive to a restart signal to read said stored information from said non-volatile memory and restart operations in accordance with said stored information.

4,527,791

INSERTER SYSTEM FOR FORMING PREDETERMINED BATCHES OF DOCUMENTS AND INSERTING THE BATCHES INTO ENVELOPES

Peter N. Piotroski, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,687
Int. Cl.[3] B65H *41/00*
U.S. Cl. 270—58 **16 Claims**



1. An inserter system, comprising:

(a) a sheet inserter means for assembling batches of sheets and separated forms in response to, and in accordance with, first control signals defining said batches;

(b) web module means for;

receiving a web of forms, said forms including control forms containing control information defining said batches;

scanning said forms for said control information;

storing and retransmitting said control information;

separating said forms from said web;

forming accumulations of said forms; and

feeding said accumulations to said sheet inserter means;

said web module means including web control means for controlling said web module means, said web control means being responsive to and controlling said web module in accordance with initialization signals, said initialization signals defining the configuration for a mailing, and said web control means being responsive to second control signals for forming said accumulations and for feeding said accumulations to said sheet inserter means;

(c) input means for input by an operator of information defining said initialization signals;

(d) supervisory control means for;

receiving said operator information and generating said initialization signals in accordance therewith;

receiving said retransmitted machine control and generating said first control signals in accordance therewith; and,

generating said second control signals so as to maintain synchronization between said web module and said

sheet inserter means and assure proper assembly of said batches.

4,527,792

APPARATUS FOR CHANGING THE DIRECTION OF MOTION OF LETTERS AND SIMILAR RECTANGULAR PIECES OF MAIL

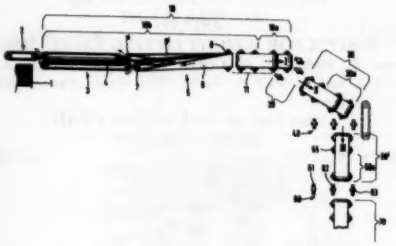
Gisbert Burkhardt, Reichenau, Fed. Rep. of Germany, assignor to Licentia-Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,339

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1981, 3134266

Int. Cl.[3] **B65H** *5/00*

U.S. Cl. 271—225 **15 Claims**



1. An apparatus for angularly changing the direction of motion of pieces of mail having a long edge and a short edge, from a direction of their long edge to a direction of their short edge, comprising:

a first conveying segment extending in a first direction for seizing and positively feeding a piece of mail in a plane with its long edge moving along a reference line and its short edge forward, said first conveying segment having a first conveying section at a downstream end thereof in which the piece of mail is displaceably moved in said first direction;

a first set of deflecting rollers by which the piece of mail is seized at its short edge and moved parallely away from said first conveying section in a second direction which is co-planar with said first direction and which forms an acute angle of at most 45° with said first direction;

a second conveying segment which extends in said co-planar second direction for receiving, seizing and positively feeding the piece of mail moved by said first deflecting device, said second conveying segment having a second conveying section at a downstream end thereof in which the piece of mail is displaceably moved in said second direction; and

a second set of deflecting rollers by which the piece of mail is seized at its long edge and moved parallely away from said second conveying section in a co-planar third direction which forms an angle of about 90° to said first direction and is co-planar with said first direction.

4,527,793

MONITORING DEVICE FOR MONITORING BOOK BLOCK FORMATION

Rolf Böttcher, Markkleeberg; Rolf Heise, and Helmut Praxator, both of Leipzig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jan. 27, 1982, Ser. No. 343,072

Claims priority, application German Democratic Rep., Mar. 19, 1981, 228434; Dec. 22, 1981, 236087

Int. Cl.[3] **B65H** *7/12*

U.S. Cl. 271—263 **7 Claims**

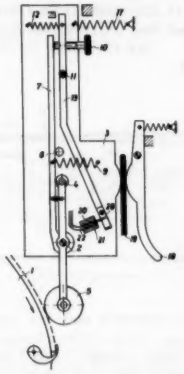
1. A device for monitoring the formation of bookblocks in a collating machine for detecting a missing sheet or faulty placement of more than one sheet at a time comprising,

a base plate movably fastened to a frame of the machine, said base plate having means for fixing said base plate in a predetermined position, and an axis thereon,

a contact lever pivotally mounted on said base plate on the axis,

a second lever pivoted to said base plate on said axis,

a stop mounted on said base plate at a position to inhibit angular displacement of said second lever in one direction



beyond a pedetermined position while permitting angualar displacement of said lever in response to sheets that are too thick or too thin,

an arm pivotally mounted on said base plate and adjustably coupled to said second lever, and

means for signalling determined variations in the angular displacement of said contact lever, said signallying means including a device connected to said arm for signally deviation of the contact lever due to a missing sheet or faulty placement of more than one sheet or too thick a sheet or too thin a sheet.

4,527,794

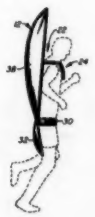
WIND RESISTANCE EXERCISE DEVICE

Joseph P. Dunn, 3455 Atwater Ct., Freemont, Calif. 94536

Continuation-in-part of Ser. No. 406,193, Aug. 9, 1982, abandoned. This application Feb. 16, 1983, Ser. No. 466,884

Int. Cl.[3] **A63B** *21/00*

U.S. Cl. 272—70 **8 Claims**



1. An exercise device comprising:

a. a frame member defining an outer perimeter;

b. an air foil, said air foil being held to said frame member in a predetermined configuration such that said air foil is placed behind the user and is spaced from the user thereby, and said air foil and frame outer perimeter extends at least laterally beyond the sides of the user for

capturing air with movement of the user to create resistance to the movement of the user;

c. means for attaching said frame member to the user in rearwardly spaced relation such that the frame member trails the user in motion, and said frame member extends from said attaching means to said held air foil without impeding the normal movement of the user's arms while walking.

4,527,795

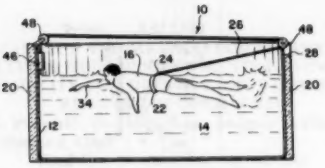
TETHERED SWIMMER'S TANK

John S. Zink, P.O. Box 7388, Tulsa, Okla. 74105

Filed Nov. 13, 1979, Ser. No. 93,060

Int. Cl.³ A63B *69/12*

U.S. Cl. 272—71 **2 Claims**



1. A tethered swimmer's tank for permitting a person to perform swimming motion within a limited space comprising a tank with water deep enough so that a person in a horizontal swimming position therein can perform said motion; a harness means comprised of a belt attached to said person; a plurality of pulleys mounted to said tank, one of said pulleys being mounted to said tank behind said person, and a second of said pulleys being mounted to said tank in front of said person; an indicator means mounted forward of said person within his/her field of view slightly above the top of said water and below the top of said tank; a cable passing around said pulleys, one end of said cable being attached to said harness while the other end of said cable is attached to said indicator means such that a force exerted by said person during said swimming motion is visually displayed by said indicator means in equivalent distance travelled per minute based on said person's swimming force.

4,527,796

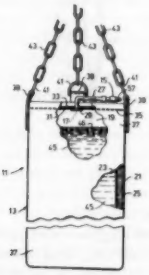
METHOD OF FILLING AN ATHLETIC BAG WITH AIR AND LIQUID

Thomas P. Critelli, 4920 Millersport Hwy., East Amherst, N.Y. 14051

Filed Sep. 30, 1980, Ser. No. 192,359

Int. Cl.³ A63B *67/00*

U.S. Cl. 272—77 **4 Claims**



1. A method for preparing for use an athletic bag of controllable blow responsive characteristics, suitable for being struck by a part of the body of an athlete during practice and for controllably absorbing the force of such blow, said bag including a container for holding fluid under pressure, an opening in said container and a push-pull valve for communicating with such opening and selectively permitting or preventing movement of fluid through it, which container includes a flexible substantially non-elastomeric cylindrical outer cover and an elastomeric fluid-tight inner bladder of essentially the same size and shape as the cover, capable of holding liquid and gas under pressure, which comprises adding liquid to the interior of said bladder through said valve to fill said bladder to 75–99% of its volume, and raising the pressure in the bladder to from 0.01 to 0.4 kg./sq. cm. gauge by blowing air through said valve into the bladder, and closing the valve, with the bladder, under such pressure, being restrained by the cover against expansion and exerting a controllable pressure on said cover.

4,527,797

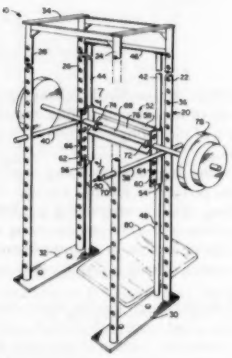
SYSTEM FOR WEIGHT LIFTING EXERCISING

James R. Slade, Jr., 45 Cedar Hill Rd., Randallstown, Md. 21133, and Richard F. Sterba, 9536 Bauer Ave., Baltimore, Md. 21236

Filed Mar. 28, 1983, Ser. No. 479,311

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—123 **17 Claims**



1. In a system employing a frame of the power rack type which may be used with a barbell that includes an assembly of weight plates on a weight lifting bar and which is of the type having: a plurality of uprights held in generally rectangular plan-relation as first and second pairs of uprights and each upright having vertically a generally uniform series of holes transversely therethrough, respective holes of the first pair of uprights being in horizontal alignment and respective holes of the second pair of uprights being in horizontal alignment, a first support rod mounted in a respective hole in at least one upright of said first pair of uprights, and a second support rod mounted in a hole in at least one upright of said second pair of uprights, the improvement comprising: means adapting said system for use as a safety system in performance by a user of guided leg presses, guided bench-presses, guided standing-presses and the like, said means adapting including: a slider system, means for holding said slider system between an upright of the first pair of uprights and an upright of the second pair of uprights, said slider system having means for adjustably securing said barbell in a horizontal position transverse to said first support rod and said second support rod with said barbell extending over and across said first support rod and said second support rod, said means holding the slider system permitting sliding of the slider system a distance upwardly from said first and second support rods, said means for holding the slider system including: first and second guide shafts, means for fixing said first and second guide shafts in parallel-spaced

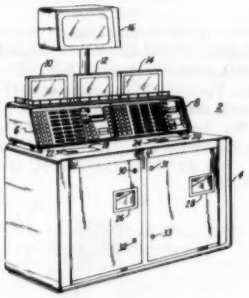
relation between an upright of said first pair of uprights and an upright of said second pair of uprights, said frame having a forward portion and a rearward portion, said first and second guide shafts being adjacent to said rearward portion, the slider system further including a respective slider sleeve on said first and second guide shafts, a cross member joining the slider sleeves, and said means for adjustably securing comprising a respective flange extending in a fore-and-aft plane along the length of each slider sleeve.

4,527,798

RANDOM NUMBER GENERATING TECHNIQUES AND GAMING EQUIPMENT EMPLOYING SUCH TECHNIQUES

Walter R. Siekierski, Troy, and Michael Sterling, Utica, both of Mich., assignors to Video Turf Incorporated, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,361
Int. Cl.[3] A63F *5/00*
U.S. Cl. 273—86 R **3 Claims**



1. In a gaming device wherein the occurrence of a fortuitous event is accompanied by a display of odds associated with the probability of the occurrence of said fortuitous event and successful wagers as to the occurrence of said fortuitous event are paid in amounts related to said probability of said occurrence of said fortuitous event; the improvement comprising:

means for generating random numbers;

means for storing a plurality of differing probability tables, each of said plurality of probability tables defining differing probabilities of occurrence of several events;

means responsive to a random number generated for selecting a stored probability table defined by said random number and displaying odds associated with the probability of occurrence of the several events set forth therein;

means responsive to another random number generated for selecting the occurrence of said fortuitous event from said several events; and

means responsive to a selecting of said occurrence of said fortuitous event and said stored probability tables selected for paying any successful wager made in accordance with odds associated with the probability of said fortuitous event present in said stored probability table selected.

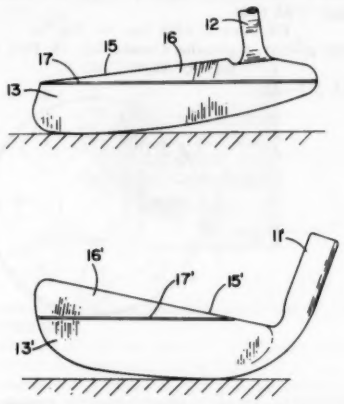
4,527,799

GOLF CLUB HEAD

Kasten Solheim, 501 Wakonda La., Phoenix, Ariz. 85023

Continuation of Ser. No. 412,174, Aug. 27, 1982, abandoned. This application Mar. 27, 1984, Ser. No. 593,200
Int. Cl.[3] A63B *53/04*
U.S. Cl. 273—164 **3 Claims**

1. In a golf club head for a putter having a hosel and a ball striking face between a toe end and a heel end, with an upper edge that is straight over a significant upper portion of its length from the toe end to the heel end, an improvement comprised of a beveled portion of said face along the upper edge over at least a significant upper portion of the full length thereof to provide a straight line of intersection between the beveled portion and the face, said significant upper portion constituting a majority of the full length of said golf club head from head to toe, said line of intersection being visible to the



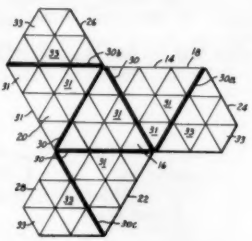
golfer in using said head to putt a golf ball and oriented to be horizontal to the ground while the club head is held from the hosel in a predetermined position with a particular angle of lie while addressing a ball and said angle of lie being selected so that a plane tangent to the sole at the center thereof is in a non-horizontal position.

4,527,800

FOLDABLE BOARD GAME WITH TRIANGULAR AND TRAPAZOIDAL AREAS

Terry Samansky, 752½ W. 10th St., San Pedro, Calif. 90731

Filed Sep. 6, 1983, Ser. No. 529,210
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—261 **6 Claims**



1. A board game comprising:

(a) a game board having a generally planar surface divided by line markings into:

(1) four triangularly shaped areas of equal size, each of said triangularly shaped areas being divided by line markings into a plurality of smaller areas; and

(2) three trapazoidal shaped areas of equal size, each having one side thereof co-extensive with one side of one of said triangularly shaped areas, each of said trapazoidal shaped areas being divided by line markings into a plurality of smaller areas; and

(b) a plurality of playing pieces, each having at least one face provided with distinctive markings said face being of a

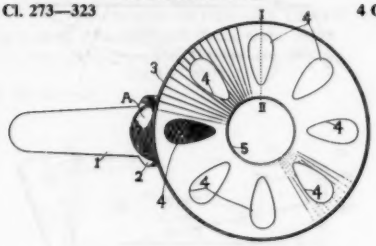
size and shape corresponding to said smaller areas of said triangularly and trapazoidal shaped areas.

4,527,801

FLYABLE BALL AND FUNNEL APPARATUS

Theodore J. Lambert, 742 Lampson St., Apt. 401, Victoria, B.C., Canada (V9A 6A6)

Filed Jun. 3, 1983, Ser. No. 500,790
Claims priority, application Canada, Jun. 28, 1982, 406092
Int. Cl.³ A63B *71/00*
U.S. Cl. 273—323 **4 Claims**



1. A projectile apparatus characterized by attitude stability and support produced by deflecting surrounding fluid flow with an upright infundibular member forming a wing, comprising:

a wing formed by an upright infundibular member through which the vertical axis of said infundibular member orients generally perpendicular to the ground, said infundibular member having a concave upper side, a convex lower side, and a central aperture; and

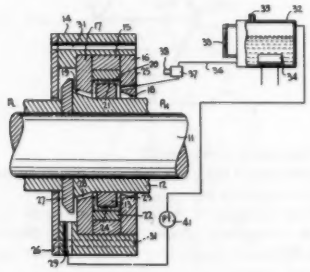
a forward projecting fuselage through which the longitudinal axis of said fuselage orients generally parallel with the ground, said fuselage having a free forward end, and a rear end near which said fuselage and said infundibular member are connected to one another.

4,527,802

INTEGRAL MAGNETIC FLUID CENTRIFUGAL HIGH SPEED GAS SEAL AND METHOD

Donald F. Wilcock, and Stanley Gray, both of Schenectady, N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,502
Int. Cl.³ F16J *15/42, 15/56*
U.S. Cl. 277—1 **20 Claims**



1. A magnetic/centrifugal-fluid seal for hermetically sealing the space between a rotating member and a close fitting spaced-apart stationary member comprising means formed on said members defining at least one common sealing region filled with a magnetically permeable fluid between opposed surfaces of the members, said common sealing region comprising both a magnetic pole-like close clearance gap region and a circumferentially arranged centrifugal seal forming region, said magnetically permeable fluid normally disposed in and filling said common sealing region with said rotating member at rest and rotating at slow rotational speeds, magnetic field producing means magnetically coupled to at least portions of said rotating and stationary members and said common sealing region and said magnetically permeable fluid in a closed magnetic circuit to form a magnetic seal in said common sealing region at slow and zero speeds of said rotating member, and said magnetically permeable fluid retained in and centrifugally pressurized in said common sealing region during high speed rotation of said rotating member to thereby form a centrifugal hermetic seal through the medium of the fluid pooled between the two members by centrifugal force, whereby there is no appreciable movement of said magnetically permeable fluid in said common sealing region during increasing and decreasing speed transitions of said rotating member and hermetic sealing is maintained.

4,527,803

BELLOWS SEAL WITH GROOVE EDGE FOLDED OVER BEAD, FOR BALL AND SOCKET JOINTS

John A. Rose, Ypsilanti, Mich., assignor to O & S Manufacturing Company, Whitmore Lake, Mich.

Division of Ser. No. 337,665, Jan. 7, 1982, Pat. No. 4,448,562.
This application Feb. 21, 1984, Ser. No. 581,720
Int. Cl.³ F16J *15/52;* **F16C** *11/06*
U.S. Cl. 277—1 **5 Claims**

1. A method of sealing a junction between an elongated member and a housing from which the elongated member projects and relative to which the elongated member swivels, said method comprising providing said housing from which the elongated member projects and swivels with an annular groove disposed around the exterior periphery of the housing, disposing a resilient open-ended tubular member around said elongated member such that an open end of said tubular member is stretched around said elongated member, providing the other open end of said tubular member with an integral reinforcing bead, fitting said integral reinforcing bead within said groove, and folding at least one edge of said groove over said integral reinforcing bead.

4,527,804

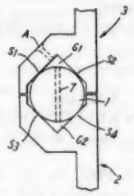
SEALING OF ELECTRICAL CABLE JOINTS, EQUIPMENT HOUSINGS, OR THE LIKE

Herbert J. C. Spencer, Ascot, England, assignor to Telspec Limited, Rochester, England

Filed Jul. 10, 1984, Ser. No. 630,583
Claims priority, application United Kingdom, Jul. 19, 1983, 8319497; Aug. 17, 1983, 8322096
Int. Cl.³ F16J *15/00;* **H02G** *15/28;* **G01M** *3/04*
U.S. Cl. 277—1 **7 Claims**

1. A method of forming an annular seal between two members, comprising arranging between respective surfaces of the two members at least one sealing ring, whereby there is formed between each respective surface of each member and said at

least one sealing ring a pair of acjacent lines of contact bounding a continuous groove, coupling each said continuous groove to means establishing a fluid pressure differing from the ambi-



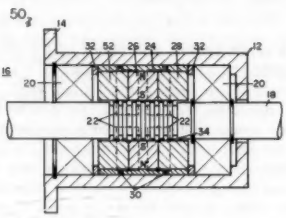
ent pressure outside said groove, whereby different fluid pressures are established on respective sides of each of said lines of contact, and monitoring any resulting fluid flow to determine the integrity of the seals provided by said lines of contact.

4,527,805

HIGH-PRESSURE FERROFLUID SEAL APPARATUS

Hanumaiah L. Gowda, Nashua, and Kuldip Raj, Merrimack, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed May 3, 1984, Ser. No. 606,582
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **10 Claims**



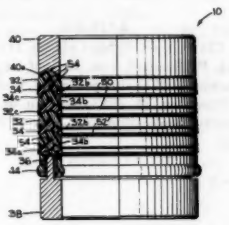
1. A high pressure ferrofluid multiple-stage seal apparatus which comprises:
(a) a housing;
(b) a magnetically permeable shaft element to be sealed and extending within the housing, the shaft element having a plurality of separate spaced-apart edges thereon;
(c) bearing means to support the shaft element;
(d) a radially polarized annular permanent magnet having a one and another end and surrounding the shaft element;
(e) a first magnetically permeable annular pole piece element having a one and another end and in a magnetic flux relationship with the radially polarized permanent magnet;
(f) the one end of the radially polarized permanent magnet and the one end of the first pole piece means extending into a close, noncontacting relationship with the edges on the surface of the shaft element to form a plurality of separate, spaced-apart radial gaps between the one end of the permanent magnet and the first pole piece element;
(g) a magnetically permeable keeper element disposed about and in a magnetic flux relationship with the other end of the radially polarized permanent magnet and the other end of the first pole piece element;
(h) ferrofluid retained in the radial gaps to form a plurality of separate O-ring ferrofluid seals about the surface of the shaft element to seal the shaft element; and
(i) the magnetic flux circuit of the high pressure ferrofluid seal apparatus extending between the radially polarized permanent magnet, the keeper element, the shaft, the first pole piece, and the ferrofluid in the radial gaps.

4,527,806

VALVE STEM PACKING

Tep Ungchusri, The Woodlands, and William J. Jakubowski, Houston, both of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 12, 1984, Ser. No. 680,870
Int. Cl.³ F16S *15/18*
U.S. Cl. 277—124 **5 Claims**



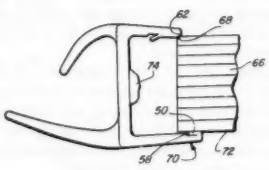
1. A valve stem packing assembly in the form of a stacked array, comprising
(a) a plurality of seal ring elements each having a generally V-shaped cross-sectional configuration;
(b) a plurality of backup/energizing rings interspersed between and in supportive relationship with the seal ring elements, said backup/energizing rings having a generally Y-shaped cross-sectional configuration;
(c) a spring-energized lip seal ring adjacent one of the backup/energizing rings, said lip seal ring including a central base and a pair of sealing lips extending therefrom whereby the lip seal ring has a generally U-shaped cross-sectional configuration; and
(d) an adapter ring having a generally T-shaped cross-sectional configuration and extending into a supportive relationship with the lip seal ring to prevent dislocation of said seal ring when the packing assembly is in functional position between a valve stem and a surrounding valve element, and said valve stem is cycled in a translatory manner.

4,527,807

PANEL EDGE GASKET

Burton A. Urbanick, La Grange, Ill., assignor to Dallas Corporation, Dallas, Tex.

Filed Jun. 25, 1984, Ser. No. 624,464
Int. Cl.³ E06B *7/22;* **F16J** *15/16*
U.S. Cl. 277—189 **11 Claims**



1. A gasket for sealing and retaining a panel edge comprising:
a rigid, resiliently deformable elongated member having a base supporting upstanding, opposed first and second legs defining a panel edge receiving channel;
first and second flexible fingers for sealing against opposing panel sidewalls adjacent the panel edge and for resisting removal of the channel from the panel, said first and second flexible fingers being respectively attached longitudinally along opposing inner faces of said first and second legs, said fingers further being adapted to flex down-

wardly into said channel and outwardly against said inner faces of said legs as the panel edge is moved into said channel; and

relief means, undercut in said leg inner faces rearwardly of the point of attachment of said fingers, for receiving said downwardly and outwardly flexing fingers as the panel edge is moved into said channel.

4,527,808

CHUCK FOR MACHINE TOOLS

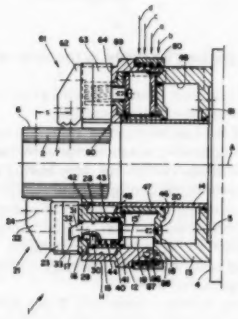
Karl Hiestand, Pfullendorf, Fed. Rep. of Germany, assignor to SMW Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 460,010

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204529

Int. Cl.³ B23B *31/02*

U.S. Cl. 279—1 J **12 Claims**



1. A chuck for lathe or similar machine tool, comprising:

a chuck body (**12**) having an axis (A) and a plurality of axially extending recesses (**15**);

a compensating jaw set (**61**) movably mounted on said body, having a compensating jaw (**62**) and actuatable to engage the compensating jaw on an irregular workpiece at an axial location with respect to the chuck body;

compensating means (**60**) mounted in one of said recesses and connected to said compensating jaw set for the actuation thereof;

a plurality of centering jaws sets (**21**) movably mounted on said body and actuatable independently of said compensating jaw set, each centering jaw set having a centering jaw (**22**) engageable with a workpiece upon actuation of its centering jaw set to engage the workpiece at a location axially spaced from said axial location of engagement for said compensating jaw;

each centering jaw set (**21**) comprising, a base jaw (**23**) mounted for movement normal to said longitudinal axis (A) and carrying said centering jaw (**22**), and a centering jaw head (**16**) movably mounted in another recess other than the recess containing said compensating means, for limited axial displacement therein;

a positioning member (**18**) axially movable in said other recess;

a ram type connecting element (**19**) arranged and movable parallel to said axis (A) and coupled between said positioning member and said base jaw, said connecting element having wedge surfaces (**32,33**) inclined with respect to said axis (A);

said base jaw (**23**) having counter-surfaces (**26,27**) engaged with said wedge surfaces of said connecting element so that axial movement of said connecting element produces radial movement of said base jaw with respect to said axis;

said connecting element (**19**) engaged with said centering jaw head (**16**) for axially moving said centering jaw head with axial movement of said connecting element; and

movement limiting means associated with said other recess for limiting the axial movement of said centering jaw head (**15**) in said other recess;

there being one connecting element (**19**) for each centering jaw head (**16**).

4,527,809

QUICK ACTION KEYLESS DRILL CHUCK

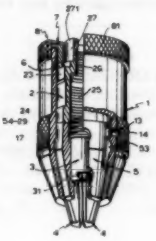
Juan Umbert, Badalona, Spain, assignor to Micron S.A.L., Barcelona, Spain

Filed Feb. 14, 1983, Ser. No. 466,218

Claims priority, application Spain, Feb. 22, 1982, 509.786

Int. Cl.³ B23B *31/10*

U.S. Cl. 279—64 **19 Claims**



1. A quick-action keyless drill chuck of a drilling machine having a spindle and a drill bit comprising:

an outer body of one piece, having a rear end;

means for connecting the spindle and the drill bit to the outer body, the connecting means being completely enclosed within the outer body and including a thrust screw movable axially in a threaded bore within said connecting means and having a hollow cylindrical shape for housing a portion of the spindle, the thrust screw having an interior divided by a separating wall so as to provide a rear cavity of a certain length dimensioned to receive with clearance the end of said spindle and a front cavity of a length smaller than the length of the rear cavity;

means for covering the rear end of the outer body.

4,527,810

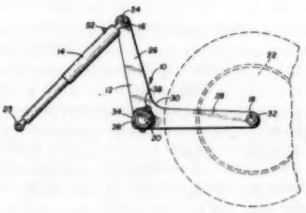
ELEVATOR SUSPENSION SYSTEM

Keith H. Nielsen, 266 Dianna Dr., Littleton, Colo. 80124

Filed Sep. 29, 1982, Ser. No. 428,180

Int. Cl.³ B60P *1/00*

U.S. Cl. 280—43.23 **5 Claims**



1. A vehicle having an integrated elevation and selectively adjustable suspension system, comprising:

a vehicle chassis;

a longitudinally disposad crank arm attached to said chassis for pivotal motion on a transverse axis, the crank arm

having first and second arm portions disposed normally to said transverse axis and having a mounting means at the end of each arm remote from the transverse axis;

first and second air-adjustable shock absorbers connected transversely in parallel with respect to said longitudinal crank arm, having a first end connected to said vehicle chassis and at a second end connected to said mounting means on the end of the first crank arm portion, one of said shock absorbers being carried on each of the opposite transverse faces of the first crank arm portion, wherein the air-adjustable shock absorbers are of the type having a variable length and variable damping characteristics in response to variation in air load;

a vehicle running gear connected to said mounting means on the end of the second crank arm portion;

said first crank arm portion being transversely positioned with respect to the second crank arm portion to dispose the two air-adjustable shock absorbers in substantial symmetry with the plane of the longitudinal center line of the vehicle running gear; and

means for selectively varying the air load of said air-adjustable shock absorbers to selectively alter their length to induce elevator action of the chassis with respect to the running gear and to selectively alter the air load of the shock absorbers for operation of the vehicle in elevated condition to alter their damping characteristics to the chassis load.

4,527,811

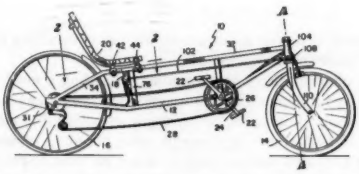
SEAT ATTACHMENT AND STEERING ARRANGEMENT FOR RECUMBENT BICYCLE OR THE LIKE

Larry A. DeMoss, Mooresville, Ind., assignor to Stephen A. Edwards, a part interest

Division of Ser. No. 338,226, Jan. 11, 1982, Pat. No. 4,431,203. This application Aug. 11, 1983, Ser. No. 522,354

Int. Cl.³ B62J *1/12*

U.S. Cl. 280—281 LP **3 Claims**



1. An arrangement for coupling a set to the frame of a velocipede, the velocipede including a frame member, the arrangement including a bracket having a central connecting leg and two end legs extending away from the connecting leg, means for attaching the bracket to the seat with the opening defined by the central connecting leg and the two end legs opening toward the frame member for engaging the frame member, openings in the frame member and the bracket end legs for alignment and means for insertion into the aligned openings to attach the seat to the frame, and further comprising second and third brackets, each having a central connecting leg and at least one end leg, the end legs on the second and third brackets extending away from opposite ends of their respective connecting legs, means for attaching the second and third brackets to the seat with the openings defined by their central connecting legs and two end legs opening toward the frame, the frame of the velocipede including a frame fork, the fork including second and third frame members, the opening of the second bracket movably engaging the second frame member and the opening of the third bracket movably engaging the third frame member, means providing openings in the second and third frame members and means providing corresponding openings in the second and third bracket end legs for alignment with the openings in the second and third frame members, and further means for insertion into the aligned further openings in the second frame member and second bracket and third frame member and third bracket to assist in attachment of the seat to the frame.

4,527,812

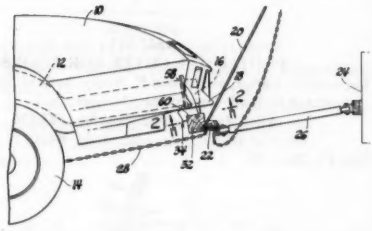
CROSSBEAM SUPPORT PAD FOR TOWABLE VEHICLE

James R. McFadden, Highland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1982, Ser. No. 442,258

Int. Cl.³ B60P *3/06*

U.S. Cl. 280—402 **3 Claims**



1. In a motor vehicle towable by towing equipment having a towing sling and a crossbeam adapted to fit between the understructure of the vehicle and the towing chains extending from the towing sling to the vehicle underbody to minimize damage to the front end of the towed vehicle, the improvement comprising:

a support pad adapted for attachment upon the understructure of the vehicle and having an upper surface adapted for engagement with the understructure and a lower surface spaced vertically below the upper surface and adapted to be engaged by the crossbeam, and said support pad having means adapted for engagement by the crossbeam to establish the crossbeam at a certain longitudinal position whereby the pad assembly locates the crossbeam to route the towing sling in lesser interference with the vehicle front end than otherwise provided by engagement of the crossbeam directly upon the underside of the vehicle to minimize damage to the front end of the towed vehicle by the towing equipment.

4,527,813

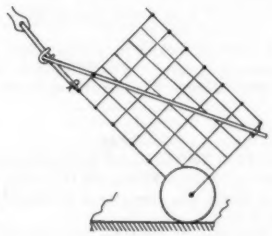
HANDLE FOR A SHOPPING CART

Lazar Kaufman, 454 Fort Washington Ave., Apt. 50A, New York, N.Y. 10033

Filed Dec. 27, 1982, Ser. No. 433,851

Int. Cl.³ B62B *1/12*

U.S. Cl. 280—654 **4 Claims**



1. In a shopping cart comprising a collapsible box, having front and rear walls, wheels supporting said box at a rear lower edge, and a traverse comprised of a U shaped member, the legs

of which are connected with the lateral sides of the box and run diagonally across those sides, and the part of the U shaped member joining the legs, extending above said rear wall, said box collapsing with movement of the front wall toward said rear wall with concommitant movement of the traverse to a position generally parallel to the rear wall, the improvement comprising,

said rear wall including vertical, laterally spaced legs extending upwardly above the box and above said joining part of the traverse,

means slidably interconnecting the joining part of the traverse and each vertical leg, the upper ends of the vertical legs being interconnected by a handle,

whereby as the box is collapsed the joining part of the traverse slides upwardly along said vertical legs.

4,527,814

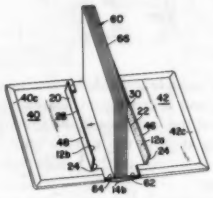
PROTECTIVE COVER FOR BOOKS

Leewood C. Carter, and Robin P. Neary, both of Warren, N.J., assignors to Book Covers Inc., Newark, N.J.

Filed Jul. 12, 1982, Ser. No. 397,476

Int. Cl.[3] **B42D** *3/00, 3/02, 3/04;* **B42C** *11/00*

U.S. Cl. 281—31 **8 Claims**



1. A protective cover for a book having first and second book covers, comprising:

a first cover section defining a first pocket having a first pocket opening for receiving said first book cover, said first cover section including two superimposed strips of paperboard material having four edges, three of said edges being affixed to each other and said fourth edge being opened to define said first pocket opening, and first locking means formed on the inside of said first cover section adjacent said first pocket opening;

a second cover section defining a second pocket having a second pocket opening for receiving said second book cover, said second cover section including two superimposed strips of paperboard material having four edges, three of said edges being affixed to each other and said fourth edge being opened to define said second pocket opening, and second locking means formed on the inside of said second cover section adjacent said second pocket opening;

a spine section affixed to said first cover section and slidably received within the pocket of said second cover section for adjusting said spine section to the size of said book being covered to form a spine area between said first and second cover sections; and

said first and second locking means operable to be fastened to a book being covered and thereby prevent said first and second cover sections from separating from each other.

4,527,815

USE OF ELECTROLESS NICKEL COATING TO PREVENT GALLING OF THREADED TUBULAR JOINTS

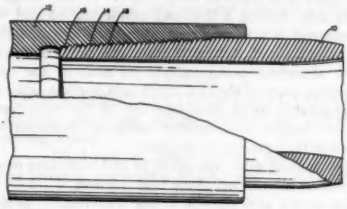
John P. Frick, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,784

Int. Cl.[3] **F16L** *9/14*

U.S. Cl. 285—55 **9 Claims**

4. A threaded connection between the end of a first pipe section and the end of a second pipe section, comprising a threaded metal socket on said first pipe section, a threaded metal end on said second pipe section to engage in said socket, and a conversion coating of a metal on said threads of one of



said pipe sections harder than the metal of the other uncoated pipe section which said metal when threaded and pressed against the softer metal will provide an effective seal.

4,527,816

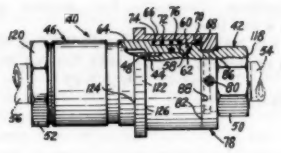
SAFETY COUPLING ARRANGEMENT

Don A. Bresie; Jack M. Burns; Donald W. Fowler, and Marion S. Sheets, all of 5407 N. IH 35, Suite 304, Austin, Tex. 73723

Filed Sep. 30, 1982, Ser. No. 428,856

Int. Cl.[3] **F16L** *15/00*

U.S. Cl. 285—81 **10 Claims**



1. A safety coupling arrangement for use in handling high pressure fluids, including:

a quick connect-disconnect coupling, including a male element and a female element adapted for interengagement and axially slidable means for use in effecting disconnection of said coupling elements, said coupling elements being provided with connector means on their respective outer end portions for connecting with conduits for carrying high pressure fluids, and having generally radial abutment surfaces on said outer end portions; and

a safety cage adapted to be received over said quick connect-disconnect coupling after said male and female coupling elements have been interengaged;

said safety cage having an axial length greater than the distance measured between said generally radial abutment surfaces on the outer end portions of said coupling elements when said elements are interengaged, and being designed and arranged to engage behind said abutment surfaces so as to prevent said interengaged coupling elements from premature separation;

said safety cage comprising:

a pair of parallel end plates, said end plates having cross-sectional dimensions larger than the maximum cross-sectional dimensions of said coupling, and each end plate having an inverted, generally U-shaped cutout in the bottom edge thereof so that it can be placed over conduits connected with said connector means on said coupling outer ends;

top strap means connected at its opposite ends to the upper portions of said end plates, and extending therebetween;

a pair of side strap means, said side strap means being disposed on the opposite sides of said end plates, and each

being secured at its opposite ends to the side edge portions of said end plates and extending therebetween;

said top and side connecting strap means serving to space the inner, confronting surfaces of said parallel end plates a distance apart that is slightly greater than the distance measured between said abutment surfaces on the outer end portions of said coupling elements when said male and female coupling elements are interengaged, and said inverted cutouts being sufficiently small in cross-section that the areas around the peripheries thereof confront said abutment surfaces when said safety cage is placed upon said coupling; and

means carried by at least one of said top and said side strap means, arranged to be engageable with said axially slidable coupling means when said safety cage is received over said coupling, to prevent relative movement of said axially slidable means into a position wherein said coupling elements can be disconnected.

4,527,817

QUICK COUPLING DEVICE

John Persson, Grödinge, Sweden, assignor to Nolek System AB, Norsborg, Sweden

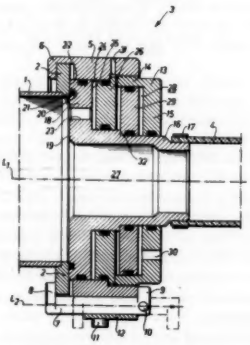
PCT No. PCT/SE81/00390, § 371 Date Aug. 3, 1982, § 102(e) Date Aug. 3, 1982, PCT Pub. No. WO82/02240, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 22, 1981, Ser. No. 406,234

Claims priority, application Sweden, Dec. 22, 1980, 8009077

Int. Cl.³ F16L *17/02*

U.S. Cl. 285—96 **6 Claims**



1. A device for coupling, especially temporarily, a conduit for fluid under pressure, to a pipe nipple or the like having an end surface, said device comprising: a substantially cylindrical casing, means for mechanically connection said casing to the pipe nipple, a coupling piston displaceably disposed in said casing and having a through-opening for fluid-connecting the conduit with the pipe nipple, said casing and said coupling piston in part confining therebetween a first chamber and a second chamber, means for sealing said first and second chambers respectively with respect to said casing and said coupling piston, an actuating piston in said first chamber and displaceable by an actuating fluid and engageable with said coupling piston for moving said coupling piston into engagement with the end surface of the nipple, means in said end face for sealing said coupling piston with respect to the end surface of the nipple, said coupling piston having an end face for engagement against the end surface of the nipple and a piston surface facing away from the end face and in part confining said second chamber, and means for providing fluid-communication between said second chamber and said through-opening, the piston surface subject to the fluid under pressure being larger than the end face of the coupling piston subject to the fluid under pressure when said coupling piston engages the end surface of the nipple; whereby when said casing is connected to the pipe nipple by said mechanical connecting means and said coupling piston is brought into sealing contact with the end surface of the nipple by actuating fluid applied to said actuating piston, the pressurized fluid from the conduit increases the force by which the coupling piston engages the pipe nipple end surface.

4,527,818

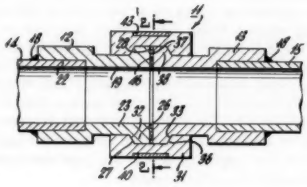
COUPLING FOR PIPE OR TUBING

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 234,295, Feb. 17, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,485

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—174 **1 Claim**



1. Coupling for pipe or tubing used in deep well operations wherein no torque or rotation is applied to said pipe during connection or use in the well, comprising in combination

(1) a pair of ceramic pipes to be joined,

(2) a cylindrical connector for each end of said pair of ceramic pipes to be joined, said connector comprising

(a) a cylindrical collar having an axial bore said bore having the same inside diameter as said ceramic pipe,

(b) a socket in said cylindrical collar having inside diameter for making a shrink fit and located at one end of said collar for receiving an end of said pipe for making said shrink fit,

(c) a cylindrical extension at the other end of said connector from said collar and having a flanged tip,

(d) said flanged tip having an outside diameter the same as said collar outside diameter and an axially tapered shoulder,

(e) said flanged tip also having a transverse planar surface extending the fill radial with of said tip,

(3) a two piece split ring clamp made of 17-4 PH stainless steel, comprising

(a) a pair of axially tapered inside surfaces for cooperating with a pair of said flanged tip axially tapered shoulders in order to apply an axial force toward each of said transverse planar surfaces, and

(b) a peripheral shallow groove located centrally on the outside of both pieces of said split ring clamp,

(4) a hose clamp for encircling said split ring clamp and located in said shallow groove for applying radial pressure against said split ring clamp, and

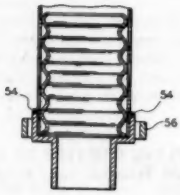
(5) a corrugated gasket made of 316 stainless steel for having a coefficient of thermal expansion higher than said 17-4 PH stainless steel and located between said transverse planar surfaces for creating a seal at said coupling, and whereby torqueless coupling of ceramic pipes may be made having superior tight coupling under high temperature conditions down hole.

4,527,819

FROST-FREE METAL HOSE CONSTRUCTION

Norman H. Desilets, Enfield, Conn.; Chester T. Gazda, and Richard A. Zamachaj, both of Chicopee, Mass., assignors to Titeflex Corporation, Springfield, Mass.

Filed Sep. 13, 1983, Ser. No. 531,945
Int. Cl.³ B23K *35/12*
U.S. Cl. 285—287 **10 Claims**



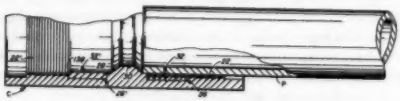
1. A braided hose having a frost-free connector, said hose comprising a convoluted liner having a braid covering, said frost-free connector comprising a socket part having a depth equal to the length of one-half to one convolution and an inside diameter approximately equal to the outside diameter of said braid, said socket being fitted over the end of said hose whereby there is a joint between the outside of said braid and the inside of said socket, and a brazing material surrounding the outside and exposed joint between said braid and said socket, said brazing material being drawn into said joint by capillary action while said brazing material is molten, whereby any voids in said molten material within said joint resulting from incomplete capillary action are exposed to the interior and not the exterior of said joint.

4,527,820

POSTIVE SEAL STEEL COUPLING APPARATUS AND METHOD

Jack E. Gibson, 4905 Pepperidge Pl., Odessa, Tex. 79761

Filed Mar. 14, 1983, Ser. No. 450,033
Int. Cl.³ F16L *13/14*
U.S. Cl. 285—382.2 **13 Claims**



9. A connector device for use in building pipelines by joining one constant diameter marginal end of a pipe to a marginal end of another pipe by said connector device;

said connector device has an axial passageway formed therethrough, a marginal length of said axial passageway is made into a pipe receiving socket;

a marginal length of said passageway includes circumferentially extending cutter blades which are of an inside diameter which is smaller than the constant diameter marginal end of a pipe to be joined into a pipeline by said connector device;

said cutter blades are in the form of a plurality of circumferentially extending blade members which are increased in thickness in a direction radially away from the longitudinal axial centerline of the connector device, said blades are inclined towards a medial part of the connector device and in a direction away from the pipe end to be received therewithin;

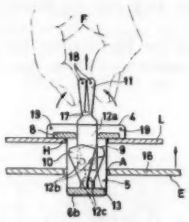
a circumferentially extending groove formed within said passageway at a location spaced from one end of said socket; a deformable annular seal member received within said groove, said seal member has an inside diameter which is less than the outside diameter of the marginal pipe end to be received therein; said seal receiving groove is formed from a location adjacent to the cutter blades to a location at the medial part of the bore; seal means formed on the inside surface of said seal member, said seal means and said cutter blades being substantially uninterrupted and continuous from the outermost end of the blades to the innermost end of the seal means, so that when the pipe end is forced into the connector device, the cutter blades and seal means are deformed and tightly engage the marginal pipe end.

4,527,821

LATCH DEVICE FOR DOOR OR LID

Toshie Tanaka, Machida, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Sep. 29, 1982, Ser. No. 426,528
Int. Cl.³ E05C *19/06, 9/00*
U.S. Cl. 292—19 **6 Claims**

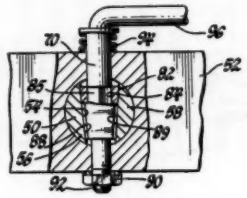


1. A plastic latch device adapted for mounting in an apertured door or lid, comprising: a latch body having (1) a flange-like head and a depending stud-like hollow housing including snap engaging means for mounting by telescoping in the aperture of said door or lid, said housing having an opening on opposite sides thereof and including a pair of axially extending spaced side walls interconnected at their free end opposite said head by endwall means, said spaced sidewalls defining said opposite openings, (ii) at least one latch pawl one end of which is resiliently secured by suitable means to said housing endwall means and the other of which is configured to extend laterally from within said housing and adapted to extend through said opening engage an edge of an opening penetrated by said stud-like housing and closed by said door or lid, and (iii) said suitable means including a resilient piece capable of assuming a first attitude wherein said at least one latch pawl is normally projected from an opening at the side of said housing and a second attitude wherein said pawl is retracted inwardly of the housing, said resilient piece normally being urged to assume said first attitude; a knob including a head portion normally positioned adjacent said flange-like head and adapted to be gripped by an operator; and a connecting section disposed between said knob head portion and said resilient piece to move said resilient piece from said first attitude to said second attitude by axially pulling said knob portion away from said housing head said latch body flange-like head being recessed to accept said knob head portion in flush array, said knob head portion being normally flat and generally perpendicular to said connecting section, said knob head portion further including at least one centrally disposed transverse hinge line whereby oppositely extending margins of said knob can be brought into juxtaposed relationship generally coaxial with said connecting section for gripping by said operator

4,527,822
SUNROOF LATCH

Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1983, Ser. No. 521,678
Int. Cl.³ B65D *45/30, 45/32*
U.S. Cl. 292—257 **1 Claim**



1. A latch mechanism for securing a removable roof closure panel in a vehicle body roof opening comprising:

a pin projecting from the closure panel and bifurcated by a central slot defining angularly disposed slot walls dividing the pin into a pair of legs;

a receptacle mounted on the vehicle body and having a first bore adapted to receive the pin when the roof closure panel is lowered into a closed position with respect to the roof opening and a second bore transversely bisecting the first bore;

a latch lever pivotally mounted within the second bore and having a shank portion received within a slot of the bifurcated pin and straddled by the legs when the closure panel is lowered into the closed position with respect to the roof panel;

cam means carried by the latch lever shank portion and being tapered along the length so that the cam means contacts with the angularly disposed slot walls of the pin, said cam means being effective upon rotation of the latch lever to forcibly spread the legs into latching engagement with the first bore of the receptacle to latch the roof closure panel in the closed position; and

adjusting means acting between the receptacle and the latch lever to enable transverse adjustment of the cam member to determine the extent of forcible spread of the legs into engagement with the first bore.

4,527,823
BATTERY CARRIER

Stephen H. Straus, 567 Livingston, St. Paul, Minn. 55107

Continuation-in-part of Ser. No. 401,531, Jul. 26, 1982, abandoned. This application Aug. 5, 1983, Ser. No. 520,836
Int. Cl.³ B65G *7/12;* **B66C** *1/44*
U.S. Cl. 294—16 **2 Claims**

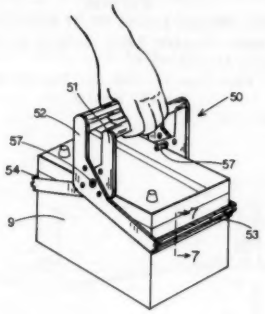
1. A battery carrier or the like made from a nonelectrical conducting material comprising:

a first handle having an area for a user to grasp;

said first handle having a first battery gripping member attached thereto and having sufficient length to extend beyond the end wall of a battery to be carried, said battery gripping member having a straight section with a plurality of ridges extending therealong for grippingly engaging a portion of a battery, said first handle and said first battery gripping member forming a first continuous loop;

a second handle having a second battery gripping member attached thereto and having sufficient length to extend beyond the end wall of a battery to be carried, said second battery gripping member having a straight section, a plurality of ridges extending therealong for grippingly engaging a portion of the battery, said second handle and said second battery gripping member forming a second continuous loop, said second handle and said first handle pivotally connected to each other; and

said battery gripping members characterized by each being sufficiently rigid to support itself yet sufficiently flexible to conform to a battery to be lifted whereby an operator can lift or carry a battery by forcing said plurality of the ridges of said first battery gripping member and said plurality of the ridges of said second battery gripping member against opposite ends of a battery, said battery carrier including a first pivotal member connecting said first handle to said second handle and a second pivotal member connecting said first handle to said second handle, said pivotal members extending sufficiently inward from said first handle and said second handle to form a stop to prevent said first handle and said second handle from coming in contact with the top of a battery located in said battery carrier.



4,527,824
VACUUM CANE FOR PICKING UP ARTICLES OFF THE FLOOR

Paul Rosenfeld, 147-15 258th St., Rosedale, N.Y. 11422

Filed Jul. 6, 1984, Ser. No. 628,624
Int. Cl.³ B25J *15/06*
U.S. Cl. 294—64.1 **5 Claims**

1. A vacuum cane for picking up articles off the floor which comprises:

(a) a hollow cylindrical cane-shaped housing having a curved hand grip at top, said housing having a perforated inlet port at bottom and a perforated outlet port at end of said curved hand grip;

(b) an electric fan affixed vertically within said housing near said hand grip to provide suction for said vacuum cane;

(c) at least one battery affixed within said housing near said electric fan to supply power to said electric fan; and

(d) an inverted cup affixed around bottom circumference of said perforated inlet port of said housing, said cup creates a seal around its periphery so that a vacuum is created

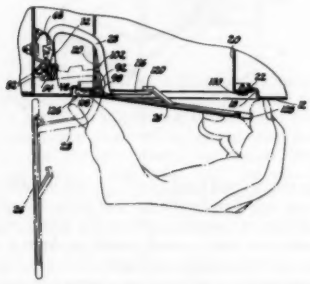
applying suction of a small area to a large area when placed against said article which will result in said vacuum cane being able to apply a larger force on said article thus allowing heavier weighted articles to be picked up off the floor.

4,527,825

FUEL FILLER DOOR WITH DUAL HINGE

Clarence Clouse, Ferndale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1983, Ser. No. 552,704
Int. Cl.³ B60J *9/00*
U.S. Cl. 296—1 C **3 Claims**



1. In a vehicle body having a fuel filler neck mounted within a flanged opening of a vehicle body panel and a door adapted to fit within the opening flush with the vehicle body panel, a hinge construction mounting the door for movement between a closed position in flush fitting relationship with the vehicle body panel to cover the filler neck and an open position uncovering the opening for access to the fuel filler neck comprising:

a hinge bracket having one end connected to the vehicle body and the other end connected to the door;

main pivot means connecting the hinge bracket and the vehicle body and having associated spring means urging the hinge bracket in the direction to close the door;

auxiliary pivot means connecting the hinge bracket with the door and having associated spring means urging the door to the closed position and stop means acting to limit the pivotal movement of the door relative the hinge bracket; and

said auxiliary pivot means being located at a spaced relationship from one edge of the door so that inward pressing of that one edge of the door pivots the door about the auxiliary pivot means to open the other end of the door a limited distance defined by the stop means to enable finger gripping of the other end of the door for a subsequent further pivotal movement of the door and hinge bracket about the main pivot means to open the door.

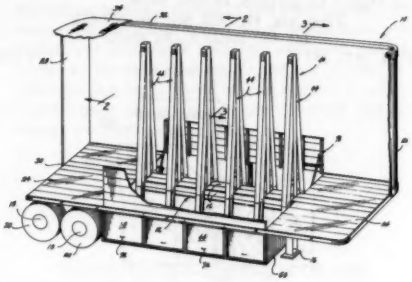
4,527,826

CONVERTIBLE TRAILER APPARATUS

John L. O'Neal, 24982 Thompson Rd., Perrysburg, Ohio 43551

Filed Aug. 12, 1983, Ser. No. 522,745
Int. Cl.³ B60P *3/42*
U.S. Cl. 296—3 **15 Claims**

1. A convertible trailer apparatus comprising, in combination, a longitudinally extending frame, a plurality of A-frame members disposed in spaced apart relationship along said frame, said A-frame members having an upper, demountable section comprising at least a pair of beams diverging from an apex and lower support members aligned with said beams, means for selectively coupling said upper sections to said lower support members, a floor panel movable between a first horizontal position overlying said lower support members and



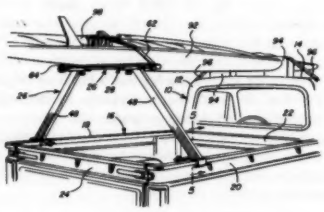
a second position exposing said lower support members and permitting securement of said upper sections to said members.

4,527,827

VEHICLE RACK FOR SURFING BOARD

Jack E. Maniscalco, 9901 Lone Tree La., Tampa, Fla. 33618, and Alberto Souto, 8217 La Serena Dr., Tampa, Fla. 33614

Filed Sep. 7, 1983, Ser. No. 530,091
Int. Cl.³ B60R *9/08*
U.S. Cl. 296—3 **5 Claims**



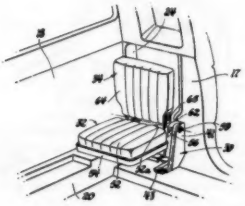
1. In combination with a pair of generally parallel walls, a rack for supporting a load in position spaced above said walls and between the latter, said rack comprising an elongated support member for disposition in elevated position above the area disposed between said side walls and with said support member extending transverse to said side walls, a pair of oppositely downwardly inclined and horizontally spaced apart legs, the upper ends of said legs and the opposite end portions of said support member including coacting means mounting the upper ends of said legs to said end portions of said support member for adjustable shifting therealong while maintaining a predetermined angular relationship between said support member and each of said legs and releasably anchoring each of said legs in adjusted shifted position along the corresponding support member end portion, support means carried by the lower ends of said legs releasably supporting said lower ends from the upper marginal edge portions of said walls, said support means comprising downwardly opening generally C-shaped channel members carried by the lower ends of said legs and disposed generally transverse to said support member, said channel members each being provided with a clamp screw threadedly supported therefrom, the remote sides of said C-shaped channel members including depending stake portions for downward reception in upwardly opening stake receiving pockets formed in the upper edges of said walls.

4,527,828

SIDE MOUNTED JUMP SEAT FOR AN AUTOMOTIVE VEHICLE

James S. Groce, Utica, and Edward A. Sabo, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1983, Ser. No. 521,136
Int. Cl.[3] B60N 1/02
U.S. Cl. 296—65 R 6 Claims



1. In an automotive vehicle having a body including interior trim means defining an interior compartment and a recess in the trim means facing the interior compartment, a foldable jump seat assembly supported by said body adjacent said recess which can be folded from a storage position within said recess to a seating position,

said seat assembly comprising a stationary seat frame secured to the vehicle body and having a pair of spaced side supports,

a seat cushion unit including a seat cushion having front and rear ends and a support means including a pair of spaced side legs extending from the rear end of the seat cushion,

said legs intermediate their ends being pivotally supported on said side supports of said seat frame by pivot means for movement between an upright storage position within said recess and in which said seat cushion has its underside disposed substantially flush with adjacent areas of said interior trim means and a seating position in which said seat cushion is substantially horizontally disposed,

said legs adjacent their outer free end portions engaging stops on said side supports of said seat frame when the seat cushion is in its substantially horizontal position whereby said seat cushion assembly is supported in a cantilever fashion by said seat frame,

a pair of spaced brackets secured to said legs of said seat cushion assembly intermediate the rear end of the cushion and said pivot means and extending transversely of said legs,

a seat back unit including a back rest and means for pivotally connecting said seat back unit at its lower end to said brackets for limited pivotal movement relative thereto and with the seat back unit at its upper end being free whereby said

seat back unit is caused to be moved downwardly and outwardly of said recess so that said seat back unit is disposed wholly outwardly of said recess when said seat cushion unit is moved from its storage position to its seating position,

said seat back unit being caused to be moved in the reverse direction in response to movement of said seat cushion unit from its seating position to its storage position so that the seat back unit is disposed behind the seat cushion in the storage position,

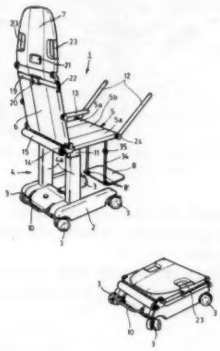
and means for biasingly retaining the seat assembly in either its storage or seating position when moved thereto.

4,527,829

FOLDABLE WHEEL CHAIR, ESPECIALLY FOR INVALIDS

Udo Fanslau, Hamburg, and Norbert Grosche, Jork, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,523
Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121127
Int. Cl.[3] A47C 4/20; A61G 5/00
U.S. Cl. 297—17 16 Claims



1. A foldable wheel chair having a central plane of substantial symmetry extending vertically through the chair, comprising base means (2, 3), foldable components including a bipartite support structure (4) normally extending vertically from said base means, seat means (5) supported by said bipartite support structure (4), backrest means (6, 7) secured to said seat means, wherein said backrest means comprise a lower backrest portion (6) and an upper headrest portion (7), footrest means (8) secured to said seat means (5), horizontally extending journal means extending perpendicularly to said central plane of substantial symmetry and connected to said foldable components for folding said foldable components, guide track means (18) secured to said seat means (5), said guide track means extending in parallel to said vertical central plane, and guide rail sections (17) pivoted to said support structure (4) and sliding in said guide track means for sliding said seat means horizontally back and forth, said horizontally extending journal means for folding said foldable components comprising first journal axle means (25) for journalling said upper headreast portion (7) back (arrow 26) against said lower backrest portion (6), second journal axle means (30) for journalling said lower backrest portion (6) down (arrow 31) against said seat means (5), third journal axle means (35) for journalling said footrest means (8) back (arrow 33) under said seat means (5), fourth journal axle means (37) for journalling said support structure (4) forward into said base means (2), and fifth journal axle means (39) for journalling said seat means (5) down to said base means (2), so that said guide track means (18) slies back in said guide rail sections (17) wherein said horizontally extending journal means include locking means for maintaining an operative position.

4,527,830

INFANT SEAT AND TABLE AND SUPPLY CARRIER

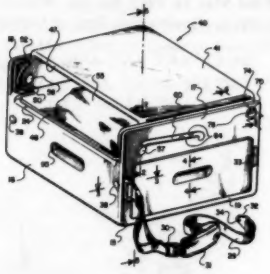
Roger A. Meyers, 1150 B. Westlake Blvd., Westlake Village, Calif. 91361

Filed May 4, 1983, Ser. No. 491,575
Int. Cl.[3] A47C 7/62
U.S. Cl. 297—192 16 Claims

1. A device for transporting infant supplies and for support-

ing an infant comprising a main body having upright wall means comprising a plurality of generally upright walls connected on their sides to adjacent upright walls forming a central cavity inside the upright walls,

an upper support surface extending inward from the upright wall means below the top edge of the upright wall means,



an infant support member on the upper support surface comprising a pair of table members hinged with respect to each other, and

securing means on the upright wall means above the upper support surface for attaching the infant support member to the upright wall means.

4,527,831

MOTORCYCLE

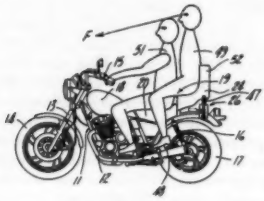
Tatsuzo Katsuoka, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jun. 21, 1982, Ser. No. 390,375

Claims priority, application Japan, Jul. 1, 1981, 56-101253

Int. Cl.³ A47C *15/00*

U.S. Cl. 297—243 **7 Claims**



1. In a motorcycle seating arrangement comprising a front seat providing a substantially horizontally extending seating surface of sufficient horizontal extent to seat a rider and a rear seat providing a substantially horizontally extending seating surface of sufficient horizontal extent to seat a passenger behind said rider, the improvement comprising said rear seat being supported for vertical adjustment relative to said front seat so as to raise and lower the seating elevation of a passenger seated on said rear seat relative to a rider seated on said front seat.

4,527,832

SEATING APPARATUS WITH REMOVABLE RECLINABLE BACK ASSEMBLIES

Kevin W. McMains, Grand Rapids, and Larry A. Wilkerson, Comstock Park, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Mar. 17, 1983, Ser. No. 476,421

Int. Cl.³ A47C *1/024, 7/42*

U.S. Cl. 297—355 **8 Claims**

1. In a vehicle seating assembly the combination comprising: a support frame supporting at least one seat; a seat back assembly mountable to said support frame; and mounting means for mounting said seat back assembly on said support frame for reclinable movement relative to a normal generally upright position, said mounting means including a fixed pivot means secured to said support frame and an adjustable pivot means carried by said support frame, said back assembly having first and second pivot receptors, said fixed pivot means having a first pivot pin which is received by said first pivot receptor, said adjustable pivot means having a second pivot pin aligned coaxially with said first pivot pin and said adjustable pivot means being constructed and arranged for movement horizontally along said support frame toward and away from said fixed pivot means between a first position in which said second pivot pin is received by said second pivot receptor and a second position in which said second pivot pin is disengaged from said second pivot receptor, and locking means for releasably securing said adjustable pivot means to said support frame to maintain said adjustable pivot means at said first position, thereby maintaining said first and second pivot pins of said fixed and adjustable pivot means in receiving engagement with said first and second pivot receptors to mount said seat back on said support frame for pivotal movement relative thereto, and said locking means being releasable to permit said adjustable pivot means to be moved to said second position permitting removal of said seat back from said support frame.

4,527,833

HEAD REST ATTACHMENT

James J. Parker, 23011 Lita Place, Woodland Hills, Calif. 91364

Filed Jan. 10, 1983, Ser. No. 456,834

Int. Cl.³ A47C *7/36*

U.S. Cl. 297—397 **5 Claims**

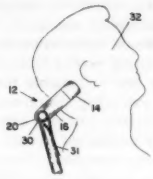
1. A head rest attachment for the back of tubular framed outdoor type furniture having webbing extending up the front side of the back of the furniture, comprising:

a head support member, having a padded concave head engaging surface,

clamping means for snapping onto and engaging a top back member of said tubular framed outdoor type furniture to hold said head support member in selected different angular orientations;

said clamping means comprising a resilient tubular section opening toward the front of said attachment, whereby it may be attached to a tubular frame, with said head rest angled forward without interfering with webbing material secured to said tubular frame;

said tubular section having an inner diameter dimensioned to make a tight fit on the upper back portion of said furniture, and having an opening of a slightly smaller dimension than



said inner diameter to permit limited rotation while gripping the top rear portion of said furniture, and

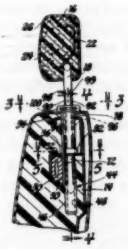
support structure means for interconnecting and aligning said head support member and said clamping means to permit a head supporting force to be created along the line between the centers of said support structure and the top back tubular member, whereby the forces tending to rotate said head rest attachment relative to the top back tubular member are minimized.

4,527,834

ADJUSTABLE HEADREST

John F. Zyngier, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 30, 1982, Ser. No. 403,557
Int. Cl.³ A47C *7/36*
U.S. Cl. 297—410 **1 Claim**



1. An adjusting headrest for a vehicle seat back having an apertured mounting bracket comprising:

a molded plastic guide adapted for insertion through the aperture of the mounting bracket and having a tubular body with a central bore therethrough, at least four of longitudinal extending circumferentially spaced slots through the tubular body communicating with the central bore to define at least first, second and third longitudinally coincident circumferentially spaced yieldable flexure fingers integral with the tubular body, at least the first and second of the flexure fingers being diametrically opposed from each other and having the third flexure finger disposed therebetween, integral abutment means carried by the first and second flexure fingers and adapted to coact with the mounting bracket in a manner to deflect said first and second flexure fingers radially inward upon insertion of the plastic guide through the mounting bracket aperture so that the abutment means is inserted through the aperture of the mounting bracket;

a support post connected to the headrest and adapted to extend through the bore of the plastic guide and limit radially inward flexure of said first and second flexure fingers to effectively maintain the abutment means in engagement with the mounting bracket to prevent removal of the plastic guide from the mounting bracket; and

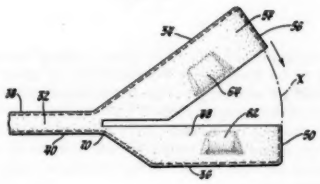
spring means adapted to encircle the tubular body and said first, second and third flexure fingers and having curled ends seated respectively in a pair of said longitudinally extending slots disposed generally opposite of said third flexure finger, said spring means having a central inwardly bent portion bearing on said third flexure fingers to urge said third flexure finger radially inward into frictional engagement with the support post to frictionally impede movement of the support post within the seat back whereby the headrest is frictionally maintained at a desired position.

4,527,835

SEAT BELT SLEEVE

Ronald R. Barnett, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1983, Ser. No. 521,679
Int. Cl.³ A47B *11/00*
U.S. Cl. 297—482 **3 Claims**



1. A molded plastic sleeve for concealing a seat belt end having an anchor plate connected to the vehicle body by an anchor bolt assemblage comprising:

a tubular sleeve enclosing the belt end; a base extending integrally from the tubular sleeve and adapted for interposition between the anchor plate and the vehicle body, said base having an integral upstanding wall;

a cover extending integrally from the tubular sleeve and adapted to overlie the base and the anchor plate and bolt assemblage, said cover having a depending wall adapted to overlie the upstanding wall of the base in parallel juxtaposed relationship therewith;

a plastic living hinge means in connection between the tubular sleeve and at least one of the base and cover to permit flexure of the base and cover between relative open positions permitting access to the anchor bolt assemblage and closed positions with respect to each other to conceal the anchor plate and anchor bolt assemblage between the cover and the base and the wall thereof; and

interfitting snap retention means molded integrally with the parallel juxtaposed walls of both the base and the cover and adapted for interfitting snap locking retention therebetween to retain the base and the cover in the closed position with respect to each other and thereby conceal the anchor plate and anchor bolt assemblage.

4,527,836

DEEP WELL PROCESS FOR SLURRY PICK-UP IN HYDRAULIC BOREHOLE MINING DEVICES

Duane C. Uhri, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,965
Int. Cl.³ E21C *37/12*
U.S. Cl. 299—17 **10 Claims**

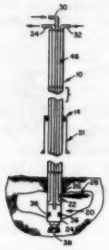
1. In an improved hydraulic mining process where a bore-

hole mining tool contained within a rotary packing seal substantially near the surface is rotated by a drill string into a subterranean deposit and hydraulically dislodges mineral bearing deposits therefrom by a directed hydraulic jet causing a slurry to be formed and brought to the surface, the improvement comprising:

(a) determining the hydraulic fracturing pressure of the subterranean cavity being formed during the mining process;

(b) determining the cavity pressure thus formed;

(c) pressurizing the cavity to a pressure above the reservoir pressure but below the hydraulic fracturing pressure;



(d) causing the velocity of the slurry exiting the slurry conduit to be from about 8 feet/second to about 30 feet/second by adjusting the cavity pressure alone and when required by using gas lift;

(e) maintaining the exiting slurry concentration so that the mined minerals or solids therein contained are in an amount of from about 5% by volume to about 50% by volume; and

(f) using an immobile slurry conduit with respect to said tool and sized with respect to the slurry concentration to be mined and the mining rate.

4,527,837

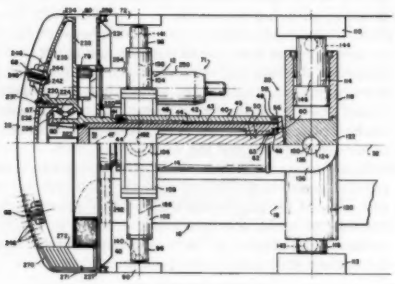
TUNNEL BORING MACHINE

Larry L. Snyder, Golden, Colo., assignor to Harrison Western Corporation, Golden, Colo.

Filed Jan. 27, 1983, Ser. No. 461,683

Int. Cl.³ E21C *29/02*

U.S. Cl. 299—31 **10 Claims**



1. An elongated tunnel boring machine, having a central longitudinal machine axis, for boring a linear tunnel section in a linear boring mode of operation or a curvilinear tunnel section in a curvilinear boring mode of operation; the tunnel having an end face and a peripheral side wall including a floor portion, a ceiling portion, and opposite side wall portions spaced from a central longitudinal tunnel axis; and the tunnel boring machine comprising:

rotatable cutting wheel means at the front end of the machine and having a central axis of rotation which is coaxial with the central longitudinal machine axis and adapted to be selectively located at a desired position approximately at the laterally opposite portion of the central longitudinal tunnel axis and held against the tunnel face during rotation for cutting material away from the tunnel face to elongate the tunnel and extend the central longitudinal tunnel axis in a selected direction;

motor means operatively connected to said rotatable cutting wheel means for selectively causing rotation thereof in a cutting mode of operation and stopping rotation thereof in a non-cutting mode of operation;

extendable and retractable thrust means, including a forwardly extending piston-rod means positioned substantially coaxially with said central longitudinal machine axis operably connected to said cutting wheel means and a rearwardly extending cylinder means positioned coaxially with and operably supporting said forwardly extending piston-rod means, for selectively causing forward movement of said cutting wheel means against the tunnel face in the cutting mode of operation during a cutting stroke said thrust means being selectively operable to cause forward relative axial movement between said piston-rod means and said cylinder means along the central longitudinal machine axis from a retracted position to an extended position to move the cutting wheel means forwardly relative to said thrust means during a cutting stroke in the cutting mode of operation and from the extended position to the retracted position to move said thrust means forwardly relative to said cutting wheel means in the non-cutting mode to prepare the machine for the next cutting stroke;

extendable and retractable rear end clamping and positioning means for fixedly locating and holding the rear end portion of the machine between opposite tunnel side wall portions with the rear end portion of the central longitudinal machine axis located in approximately coaxial relationship with the laterally adjacent portion of the central longitudinal tunnel axis in the linear boring mode and with the rear end portion of the central longitudinal machine axis located in approximately intersecting relationship with the laterally adjacent portion of the central longitudinal tunnel axis in the curvilinear boring mode, and being selectively movable between outwardly extended engaging positions and inwardly retracted non-engaging positions relative to the tunnel wall to facilitate repositioning of the machine between cutting strokes;

pivotal connecting means between said rear end clamping and positioning means and the rear end portion of the machine to provide at least one fixed rear end pivotal axis which is stationary relative said extendable and retractable rear end clamping means and the tunnel sidewall during a cutting stroke which intersects the central longitudinal machine axis for enabling the central longitudinal machine axis to be laterally pivotally displaced relative to the central longitudinal tunnel axis about said fixed rear end pivotal axis during a cutting stroke in the curvilinear boring mode of operation; and

extendable and retractable front end clamping and positioning means fixedly attached to said cylinder means for fixedly locating and holding the front end portion of the machine between the opposite tunnel side wall portions with the central longitudinal machine axis located in approximately coaxial fixed relationship with the central longitudinal tunnel axis in the linear boring mode, and for adjustably locating and holding the front end portion of the machine between opposite tunnel sidewall portions during a cutting stroke with the portion of the central longitudinal machine axis located at said front end clamping and positioning means being in variably displaced, laterally offset relationship with the central longitudinal tunnel axis of the last bored tunnel portion in the curvilinear boring mode by lateral displacement of a forward

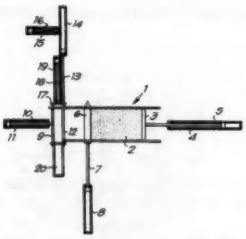
portion of the machine by said front end clamping and positioning means.

4,527,838

ARRANGEMENT FOR FILLING CASSETTES WITH FIBRES

Leonel P. Boucherie, Roeselare-Rumbeke, Belgium, assignor to Firma G. B. Boucherie, Belgium

Filed Mar. 1, 1983, Ser. No. 470,952
Claims priority, application Belgium, Mar. 4, 1982, 59615
Int. Cl.³ A46D *1/04*
U.S. Cl. 300—7 **13 Claims**



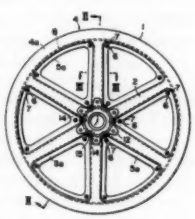
1. An apparatus for filling individual cassettes with predetermined amounts of fiber bundles of large diameter comprising:
(a) a magazine for containing a supply of fibers;
(b) a first pressing means slidable within the magazine for pressing the supply of fibers from a first side thereof;
(c) a second pressing means slidable within the magazine for pressing the supply of fibers from a second side thereof, with the first and second sides being opposed to each other;
(d) means for independently or jointly actuating the first and second pressing means;
(e) a first separating means for separating a predetermined amount of fibers from the supply of fibers;
(f) a second separating means for freeing the separated fibers;
(g) the second pressing means and the second separating means being mutually displaceable to secure and move the separated fibers to the open front portion of a cassette; and
(h) means for disposing the separated fibers into the cassette.

4,527,839

SYNTHETIC WHEEL FORMED FROM TWO HALVES

Nobuo Fujitaka, Saitama; Masaru Fujisaki, Tokyo, and Yoshitoshi Hagiwara, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,735
Claims priority, application Japan, Apr. 30, 1982, 57-73083; Apr. 30, 1982, 57-73084; Apr. 30, 1982, 57-78085; Apr. 30, 1982, 57-78086; Apr. 30, 1982, 57-73087
Int. Cl.³ B60B *5/02, 3/10*
U.S. Cl. 301—63 DD **5 Claims**



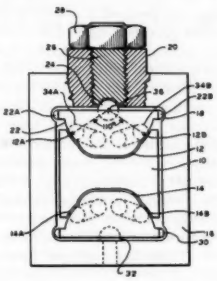
1. A wheel for vehicles comprising a wheel body having a rim portion, a plurality of spoke portions, and a hub portion; and a pair of bearing members provided at the left and right sides of said hub portion; said wheel body being integrally made of a fiber-reinforced resin: and being composed of left and right halved bodies which are symmetrical with each other relative to the center plane of the wheel body and are integrally joined with each other; each spoke portion having a square hollow cross section, with each respective spoke portion of the left and right halved bodies having matching flanges extending in said center plane, said matching flanges being joined together by a bonding agent and mechanical fastening means; said rim portion having a circumferential synthetic resin coating and an integrally formed cylindrical projection projecting radially inwardly and formed therethrough with an air valve fitting hole.

4,527,840

LINEAR BEARING

Peter Mugglestone, Cranbury, and John Cline, Highland Park, both of N.J., assignors to Thomson Industries, Inc., Manhasset, N.Y.

Filed Feb. 10, 1983, Ser. No. 465,660
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **8 Claims**



1. A linear bearing for engaging at least one longitudinal groove of rod, comprising:
a frame;
a primary carrier pivotally mounted on said frame and sized to enter said groove, said primary carrier being mounted to pivot with at least two degrees of freedom;
said primary carrier having a pair of opposing, internal raceways each having an inside and outside course, said outside course of each of said raceways having a longitudinal window opening to the outside of said carrier, said rolling means comprising:
a plurality of rolling bodies contained in said internal raceways for circulating therein, said rolling bodies being sized to project outwardly through the window of each of said raceways,
the center of rotation of said primary carrier about said frame being equidistant from the center of the window of each of said raceways, said groove having a pair of sidewalls each having a radius of curvature centered at said center of rotation of said primary carrier about said frame.

4,527,841

LINEAR SLIDE BALL BEARING AND PRODUCTION THEREOF AND LINEAR SLIDE TABLE USING THIS BALL BEARING

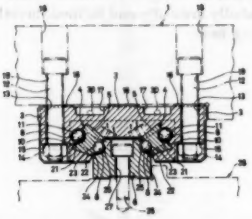
Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo 158, Japan

Filed Oct. 13, 1983, Ser. No. 541,640

Claims priority, application Japan, Oct. 25, 1982, 57-186146; Oct. 25, 1982, 57-186147

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **8 Claims**



1. A linear slide ball bearing comprising a bearing case made of synthetic resin or aluminum and molded in the shape of a letter "C" in cross section and having a recess in the under surface thereof, recessed grooves open to the inside surfaces of both sleeves thereof, the recessed grooves being wide on the bottom wall side and narrow on the opening side, and almost semicircular no-load ball guide grooves provided in the bottom walls of all these recessed grooves; a pair of bearing races made of rigid material and molded roughly in the same shape as that of said recessed grooves and mounted in the recessed groove in such a manner that the bearing race is fixed by correcting the curve of the bearing case generated when a preplaced core for forming each recessed groove is taken out at the time of molding the bearing case and having semicircular no-load ball guide grooves for forming unload ball guide holes together with no-load ball guide grooves formed in the bottom walls of the recessed grooves, and load ball grooves in the surfaces located on the opening sides of the recessed grooves; a pair of side covers made or rigid material and molded in a rectangular shape, the upper portions thereof being inserted in the recess on the under surface of the bearing case and having a raceway table provided in shoulder portions thereof with rolling grooves so located as to correspond to the load ball grooves of the bearing races and forming endless tracks mounted on both the side surfaces of the bearing case and having semicircular circumferential guide grooves on the inside surfaces, the endless track communicating both the ends of the no-load ball guide hole of the bearing case and the load ball groove of the bearing case with each other, balls being circulated therein; and a number of balls forming load ball trains by cycling in the endless tracks between the load ball grooves of the bearing races and the rolling grooves on the raceway table.

4,527,842

CONSTRUCTION FOR ADJUSTING CLEARANCE IN LINEAR SLIDE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,900

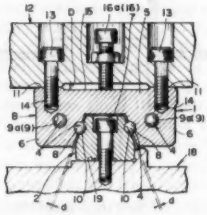
Claims priority, application Japan, May 30, 1983, 58-95481

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **4 Claims**

1. In a linear slide bearing having a sliding block having a horizontal portion and a pair of sleeve portions extending downwardly from both lateral sides of said horizontal portion, said horizontal portion and said sleeve portions cooperating in defining a recess which opens downwardly, each of said sleeve portions being provided in the inner surface thereof with a longitudinal loaded ball groove and a non-loaded ball passage corresponding to said loaded ball passage, a track shaft having an upper portion received in said recess of said sliding block such that a predetermined clearance is left between said sliding block and said track shaft, a pair of end covers secured to both longitudinal ends of said sliding block, each end cover being provided in the inner surface thereof with guide grooves so as to connect said loaded-ball grooves to corresponding non-loaded ball passages thereby to form endless ball passages, and a multiplicity of balls adapted to be circulated along said endless ball passages, said balls residing in the loaded ball passages constituted by said loaded ball grooves in said sliding block and said ball rolling grooves in said track shaft carrying the load applied to said sliding block,

a construction for adjusting said clearance characterized by comprising: a pair of mounting surfaces formed on the top



of said horizontal portion of said sliding block above said sleeve portions and extending longitudinally of said sliding block; a carrier mounted on said mounting surfaces and fastened by a plurality of fastening bolts such that a gap is left between the upper surface of the central portion of said horizontal portion of said sliding block and the opposing lower surface of said carrier; and at least one clearance adjusting bolt extending through said carrier and acting on the mid-portion of said horizontal portion of said sliding block between said supporting surfaces; whereby said horizontal portion of said sliding block is elastically deflected as said clearance adjusting bolt is tightened, so that the clearance between the inner surface of each sleeve portion of said sliding block and the opposing surface of said track shaft is adjusted as a result of the elastic deflection of said horizontal portion.

4,527,843

BED PAN AND URINE BOTTLE WASHING AND DISINFECTING MACHINES

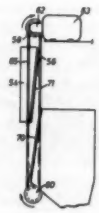
George Murdoch, Andover, England, assignor to Avon Murdoch Limited, Bristol, England

Filed Dec. 23, 1981, Ser. No. 333,891

Claims priority, application United Kingdom, Jan. 2, 1981, 8100015; Aug. 17, 1981, 8125060

Int. Cl.³ E05F *11/54;* **A47B** *81/00*

U.S. Cl. 312—31.2 **2 Claims**



1. A bed pan and urine bottle washing and disinfecting machine having a wash chamber, an opening providing access

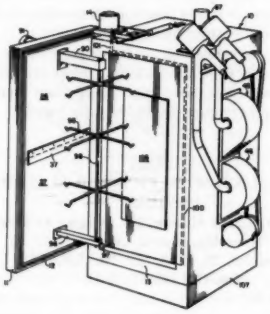
to the interior of said wash chamber, a generally wedge-shaped door having a lower edge of lesser thickness than an upper edge thereof, said door slidably mounted in guide rails provided at positions laterally of said door, said guide rails extending substantially vertically, said door having an inner face which slopes downwardly outwardly and flanges formed by wall portions of said wash chamber at positions laterally of said access opening sloping downwardly outwardly with the same angle of inclination as said inner face of said door such that said inner face and said flanges cooperate to wedgingly close said access opening, and means to seal said door around said access opening as said door moves into a closed position.

4,527,844

THERMALLY INSULATED CHAMBER

David J. Klee, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 26, 1983, Ser. No. 461,090
Int. Cl.³ F25O *11/00*
U.S. Cl. 312—214 **11 Claims**



1. A thermally insulated chamber for batch treatment of materials therein at low temperature, said chamber having side walls, a rear wall and a front doorway and a thermally insulated outer access door arranged at said doorway; mechanical means for swinging said outer door between open to closed positions, wherein

the side walls and back wall of said chamber each comprises:

(a) a rigid skeletal metallic framework,

(b) a sheet metal liner attached to the outer face of said framework, and

(c) a plurality of inner liners in abutted relation forming a seam line between their bordering outwardly bent and joined edges, thereby providing an expansion joint at said seam line;

said outer door comprising:

(d) a rigid door structural framework,

(e) a metallic outer sheet metal liner attached to the outer face of said door framework,

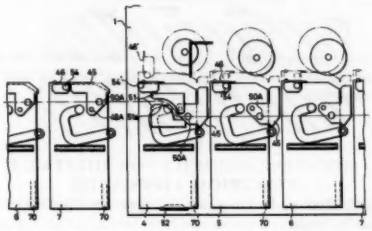
(f) and a plurality of rectangular pan-shaped inner sheet metal liners attached to the outer liner of said door inwardly of the periphery of said outer liner, thereby providing a peripheral band on the inner face of said outer liner, through which band the outer liner is attached to the framework of said outer door.

4,527,845

DEVICE FOR LOCKING FRONT COVER OF BANK NOTE CONTAINER BOX FOR USE IN AUTOMATIC MONEY DEPOSITING AND DISBURSING MACHINE

Eiichi Kokubo; Koichi Goi; Junichi Arikawa; Hideyuki Ebihara, and Hiroshi Chiba, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 463,000
Claims priority, application Japan, Feb. 4, 1982, 57-16597
Int. Cl.³ A47G *29/22*
U.S. Cl. 312—215 **4 Claims**



1. An automatic money depositing and disbursing machine wherein bank notes are deposited therein and disbursed therefrom, which comprises:

a machine body,

a stacker support frame slidably movable in a horizontal direction for insertion into and withdrawal from the machine body,

at least one box supportable on the stacker support frame,

a front cover on said box and openably mounted to permit bank notes to be stacked in and pulled out of the box through the opened front cover,

cam follower means attached to the front cover at the sides thereof,

cam means attached to the machine body for guiding the cam follower means of the front cover to open and close the front cover,

front cover locking means provided within the box for locking the front cover to prevent the front cover from being opened,

an unlock lever slidably mounted within the box to be engageable with the front cover locking means, and

an unlock cam mounted on the machine body for engaging with the unlock lever to actuate the front cover locking means through the unlock lever and thereby releasing the locking of the front cover while the cam means guides the cam follower means.

4,527,846

ZOOM FOCUS AND DEFLECTION ASSEMBLY FOR ELECTRON DISCHARGE DEVICES OF THE CAMERA TUBE TYPE

Richard J. Hertel, Ft. Wayne, Ind., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,506
Int. Cl.³ H01J *29/58*
U.S. Cl. 315—382 **23 Claims**

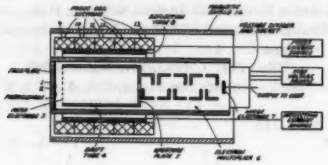
1. A zoom focus and deflection assembly for an image-to-electron beam converting electron discharge device having a given resolution comprising:

magnetic deflection means disposed about, along and coaxial of said device;

magnetic electron beam focusing means disposed along and in a predetermined relationship with said deflection means and said device and having a predetermined distribution of ampere turns therealong; and

adjustable current supply means coupled to said focusing means and operative for causing continuous simultaneous

adjustment of said predetermined distribution of said ampere turns in opposite directions from the central region toward the respective end regions of said focusing



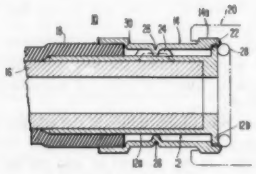
means independently of the operation of said deflection means and, hence, continuous adjustment of said given resolution.

4,527,847

MOUNTING ASSEMBLY FOR ROTATABLE ELECTRICAL CONNECTOR

Larry C. Rinker, Reading, Pa., assignor to Burroughs Corp., Detroit, Mich.

Filed May 29, 1984, Ser. No. 614,568
Int. Cl.[3] H01R *35/00*
U.S. Cl. 339—5 R **7 Claims**



1. An assembly for rotably mounting an electrical connector on at least one extremity of a jacketed, shielded cable conduit comprising:

a ferrule having a cylindrical body member and a circular flange at one extremity thereof, an external rib-like projection emanating from the periphery of said body member, said body member being disposed over said cable conduit and being immovably affixed thereto, said flange being contiguous with the cable conduit extremity,

a mounting nut having a bore for receiving said body member of said ferrule and a counterbore at one extremity thereof for rotatably accommodating said flange, at least one protrusion emanating from an internal surface of said mounting nut within said bore and situated to contact said rib-like projection of said ferrule,

said mounting nut being capable of rotation about said ferrule, the orientation of said protrusion with respect to said rib-like projection limiting said rotation to a prescribed arc, said mounting nut being adapted to engage said electrical connector to form a rotatable integral unit therewith.

4,527,848

HIGH DENSITY LOW PROFILE MULTIPLE CONTACT CONNECTOR

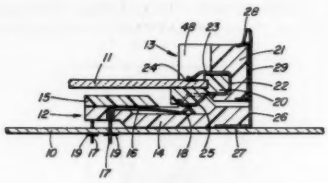
Benne Velsher, Ottawa; Jaroslav M. Hvezda, Nepean, and Richard J. Middlehurst, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 566,037
Int. Cl.[3] H01R *13/64, 13/645, 13/506;* **H05K** *1/00*
U.S. Cl. 339—17 M **12 Claims**

1. A multiple contact connector, comprising;

an elongate bottom member for attachment to a circuit board and having top and bottom surfaces and inner and outer edges; a plurality of spring bottom contact members spaced apart along the bottom member, each bottom contact member including a cantilever contact portion extending over said top surface in a direction normal to the length of the bottom member and also including a tail portion extending through the bottom member and extending from said bottom surface for passage through said circuit board;

an elongate top member for attachment to an edge of a further circuit board and having top and bottom surfaces and an outer edge; a plurality of top contact members spaced apart along the top member, each top contact member having a bottom leg extending over said bottom



surface of said top member in a direction normal to the length of said top member, and having a top leg extending over said top surface of said top member to make contact with contact pads on said further circuit board, the top contact members in said top member positioned to make contact with said cantilever contact portions of said bottom contact members in said bottom member on assembly of said top and bottom members together;

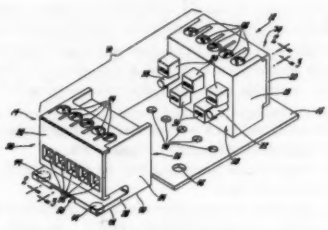
a spring member extending up from said bottom member along said outer edge and including a top portion adapted to extend over said outer edge of said top member and retain said top member on said bottom member.

4,527,849

SNAP-IN MOUNTING DEVICE FOR ELECTRICAL DEVICES

David R. Marach, Sleepy Hollow, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 29, 1983, Ser. No. 518,594
Int. Cl.[3] H01R *13/62*
U.S. Cl. 339—59 M **3 Claims**



1. A mounting for an electrical device, comprising:

a generally planar mounting surface;

a first body portion of said electrical device, said first body portion of said electrical device being rigidly affixed to said mounting surface;

a second body portion of said electrical device adapted to mechanically and electrically interconnect with said first portion at a first face portion of said second body portion;

said first body portion having a second face portion, said second face portion being adapted to mechanically and electrically interconnect with said first face portion and to

prevent movement of said second body portion transverse to said first face portion when said second face portion is engaged with said first face portion;

said second body portion including a flexible portion extending therefrom distal to said first face portion and adjacent a bottom surface of said second body portion, said bottom surface being a generally planar surface, said bottom surface being disposed adjacent said mounting surface when said first face portion engages said second face portion;

said flexible portion having at least one protrusion from a bottom surface thereof and normal thereto;

said mounting surface having at least one hole therein;

each said protrusion engaging one said hole when said first face portion engages said second face portion and preventing movement of said second body portion normal to said first face portion;

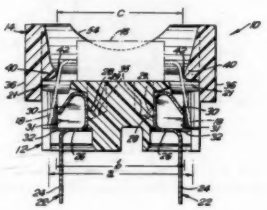
said flexible portion including an indentation in said bottom surface adjacent an edge thereof distal to said first face portion adapted to receive a prying tool for bending said flexible portion away from said mounting surface to disengage said protrusion from said hole.

4,527,850

ZERO INSERTION FORCE SOCKET

Clyde T. Carter, Shermans Dale, Pa., assignor to Sealectro Corp., Mamaroneck, N.Y.

Filed Nov. 29, 1983, Ser. No. 556,030
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—75 M **13 Claims**



1. A zero insertion force connector for use with an electrical component having a body and symmetrically arranged downwardly extending leads connected to the body, said connector comprising:

a base having a plurality of mounting portions disposed symmetrically on said base, said mounting portions on said base corresponding in number and spacing to the leads on the electrical component;

a metallic contact securely mounted to each said mounting portion, each said contact including a spring loaded contact lever extending generally outwardly with respect to said base, said base and said contact being dimensioned such that the leads of said component can be mounted respectively substantially adjacent to and outwardly from said contact levers; and

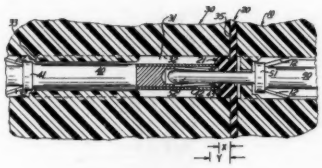
a frame mounted around said base and slidably movable to a contacting position and at least one release position with respect to the base, said frame including a plurality of inwardly directed cams aligned respectively with the mounting portions of the base, and said cams extending inwardly a sufficient distance to contact and urge the respective leads inwardly against the corresponding contact levers when the frame is in its contacting position with respect to the base; said base and said frame each include at least one ledge, said ledges on said base and said frame being positioned to engage one another when said frame is in said release position, whereby said ledges prevent unintentional removal of the frame from the base.

4,527,851

ELECTRICAL CONNECTOR ASSEMBLY HAVING AN INTERFACIAL SEAL

David O. Gallusser, Oneonta, and David L. Frear, Bainbridge, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 14, 1984, Ser. No. 610,068
Int. Cl.³ H01R *4/00*
U.S. Cl. 339—94 M **1 Claim**



1. In combination with an electrical connector assembly having an interfacial seal, said connector assembly of the type having a first insert having at least one passage extending from a forward face to a face of said insert; at least one electrical pin type contact; means for mounting each pin contact in a respective passage so that a forward mating portion of the pin contact extends from the forward face of said first insert; a second insert having at least one passage therein extending from a front face to a rear face of said second insert; at least one socket type electrical contact; means for mounting each socket type contact in a respective passage in said second insert so that the end of a forward mating portion of the socket contact terminates within said passage in said second insert at a predetermined distance X from the front face of the second insert; and an interfacial sealing member comprised of a resilient material and having at least one passage therethrough, said interfacial sealing member mounted to the forward face of the first insert with each passage through said sealing member aligned with a respective passage in the first insert, said sealing member including a forwardly extending tower around each passage in said seal and extending around a portion of the mating portion of a respective pin type contact, the improvement wherein the interfacial seal is characterized by:

each of said towers having a configuration slightly smaller than the configuration of the passage in said second insert, said tower extending forwardly in its uncompressed state a distance Y which is greater than the distance X that the end of each socket contact terminates from the front face of said second insert, each of said pin type contacts mates with a respective socket type contact, each of the towers is located in a respective passage in the second insert and the forward end of each socket contact is engaged with a forward end of a respective tower, axially compressing and distorting each tower radially outwardly to cause outside walls of said tower to be in pressure tight relationship with the wall of the respective passage in the second insert.

4,527,852

MULTIGAUGE INSULATION DISPLACEMENT CONNECTOR AND CONTACTS THEREFOR

Helen Dechelette, London, England, assignor to Molex Incorporated, Lisle, Ill.

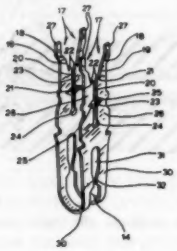
Filed Aug. 9, 1983, Ser. No. 521,769
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—97 P **5 Claims**

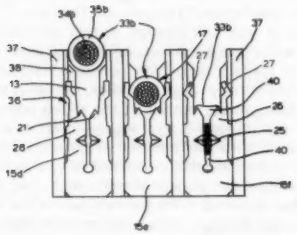
1. A U-shaped, stamped metal electrical contact member adapted to be mounted in a terminal receiving cavity of a connector housing for connecting an insulated conductor to an external terminal, said contact member including two opposed leg portions, each with a free end and a bight joining end and each leg portion having a slot formed therein including a wire

receiving mouth converging towards and leading to opposed insulation cutting edge surfaces which provide electrical connection to an insulated conductor, said contact member further including a bight portion extending between the bight joining ends of the leg portions,

the improvement comprising:

each slot extending from the free end of each leg portion towards the bight joining end thereof, with each leg portion including two opposed spaced-apart transversely





deflectable resilient limb portions each having an upper free end at the mouth having outwardly extending housing engaging means for engaging portions of the connector housing defining the terminal receiving cavity to limit outward deflection of said limbs when urged apart by insertion therebetween of an insulated wire, whereby the portion of each limb portion below the free end is outwardly bowed upon continued insertion of said insulated wire.

4,527,853

MINIATURE ELECTRICAL CONNECTOR ASSEMBLY

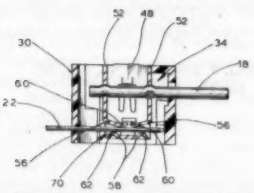
Helen Dechelette, London, England, assignor to Molex Incorporated, Lisle, Ill.

Filed Nov. 28, 1983, Ser. No. 555,784

Claims priority, application United Kingdom, Nov. 14, 1983, 8330346

Int. Cl.³ A01R *13/38*

U.S. Cl. 339—97 R **4 Claims**



1. A unitary electrical contact member for terminating an insulated conductor, the contact member having a pair of plate portions each with a slot formed therein for severing and displacing the insulation of a conductor disposed within the slot, the longitudinal axis of the conductor oriented substantially normally of the plate portions when terminated to the contact member, and the plate portions depending from a body member formed integrally between the plate portions

the improvement comprising:

a first finger depending from an edge of the body member and a second finger depending from one of the plate portions, the first and second fingers disposed in opposed spaced apart relationship one to another and cooperating to provide biased contact with a generally elongated terminal member having its longitudinal axis oriented substantially parallel to the longitudinal axis of the terminated conductor.

4,527,854

METHOD AND APPARATUS FOR CONNECTING BRANCH CIRCUITS TO CORES OF A LIVE ELECTRICAL CABLE

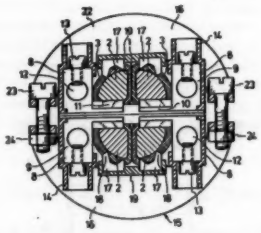
Theo Sprick, Munich, Fed. Rep. of Germany, assignor to Preformed Line Products Company, Mayfield Village, Ohio

Filed Jun. 7, 1983, Ser. No. 501,768

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3221458

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—98 **16 Claims**



4. Apparatus for electrically connecting at least one branch circuit to an electrical cable having a plurality of cable cores, comprising:

at least one contact piece having a foot-shaped extension which is insertable between at least first and second cable cores and with a branch circuit lead being connected to said at least one contact piece; and,

clamping means selectively clampable around the electrical cable and the at least one contact piece and including means for bringing the at least one contact piece with the at least one branch circuit into electrical contact with the cable.

4,527,855

ELECTRICAL PLUG CONNECTION FOR AN ELECTRICAL CABLE CONTAINING A TRACTION RELIEF

Bernhard Dietrich, Eichenau, Fed. Rep. of Germany, assignor to SDS-Elektro GmbH, Deisenhofen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,834

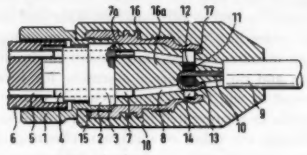
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137262

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—104 **8 Claims**

1. An electrical plug for connection to an end of a cable having a central traction member, comprising a housing and a threaded tubular adapter, said adapter having an annular supporting shoulder at the cable end reducing its interior diameter, and a traction relief element inserted within the adapter to be

supported against said shoulder, said traction relief element comprising a plate having a central bore hole for the admission of, and having wedge shaped recesses for the clamping of, the



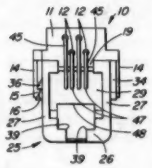
traction relief cable, said cable being bent at 180 degrees through said bore hole and recesses so as to be held in said adapter against stress.

4,527,856

MODULAR TELEPHONE JACK

Michael J. Webb, and David W. Johnson, both of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 15, 1982, Ser. No. 450,114
Int. Cl.³ H01R *13/50*
U.S. Cl. 339—206 R **6 Claims**



1. A modular telephone jack having top and bottom parts defining an aperture for a modular plug, said top part comprising;

a main body member, a plurality of bores extending longitudinally therethrough, and a plurality of grooves extending down a front face thereof, said grooves connected to said bores, a groove connected to each bore; a conductor extending through each bore, each conductor connected to a spring contact member, the contact members extending down in said grooves, and back into said aperture; a flexible member extending down at each side of the main body member and below a bottom surface of the main body member; an inwardly extending rib at a bottom end of each flexible member, each rib having a downwardly and outwardly extending lower surface; and a guide and locating surface extending down at least one side of each flexible member;

said bottom part comprising; a base web; two parallel spaced apart side webs extending up from said base web; a guide member extending up each side web on an outer surface thereof, each guide member including a guide and locating surface on one side thereof, the guide and locating surfaces facing toward a central axis of said bottom part; an outwardly extending rib extending laterally on each side web, for engagement by said inwardly extending ribs on said flexible members; and

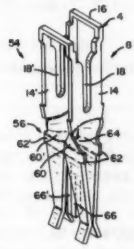
a comb member extending between said spaced apart side webs at a back end of said bottom part, said comb member comprising a web having a plurality of parallel sided slots extending down from a top edge thereof, a slot for each said groove on said main body member, said slots positioned to align with said grooves.

4,527,857

TERMINAL FOR CONNECTING A WIRE TO A BLADE TYPE TERMINAL

Donald W. K. Hughes, Mechanicsburg; Donald L. Metzger, Harrisburg, and Charles E. Reynolds, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 18, 1983, Ser. No. 485,763
Int. Cl.³ H01R *13/20, 11/20*
U.S. Cl. 339—258 S **14 Claims**



13. A stamped and formed electrical terminal of the type having a conductor-receiving end and a contact end, a conductor-receiving portion extending from the conductor-receiving end and a contact portion extending from the contact end, and a transition portion between the conductor-receiving portion and the contact portion, the conductor-receiving portion comprising first and second aligned spaced apart flat plate-like members which are connected to each other, the plate-like members having aligned conductor-receiving slots so that a conductor can be moved laterally of its axis and into the conductor-receiving slots, the transition portion and the contact portion each comprising first and second sections which extend in side-by-side relationship from the first and second plate-like members respectively, the terminal being characterized in that:

the first and second sections of the transition portion are inclined from the first and second plate-like members towards each other and towards a medial plane that is between, and extends parallel to, the planes of the first and second plate-like members and

the first and second sections of the contact portion each comprises a pair of opposed contact arms which extend from the first and second sections of the transition portion respectively, the pairs of contact arms being oriented to receive a terminal tab therebetween that lies in a plane that extends normally of the planes of the first and second plate-like members.

4,527,858

UNIFORM SPEED SCANNING LENS HAVING A HIGH RESOLVING POWER

Sadatoshi Takahashi, and Masamichi Tateoka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 331,827, Dec. 17, 1981, abandoned.
This application Nov. 27, 1984, Ser. No. 675,263
Claims priority, application Japan, Dec. 24, 1980, 55-184867
Int. Cl.³ G02B *9/58, 9/60, 27/17*
U.S. Cl. 350—6.8 **7 Claims**

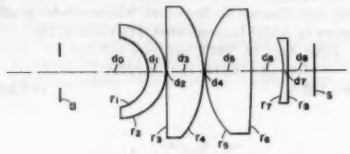
1. A uniform speed scanning lens having high resolving power, comprising, in succession from the object side on which light is incident on said lens to the image side from which light emerges from said lens:

a first component comprising a negative meniscus lens having its concave surface facing the object side;

a second component comprising at least two positive lenses; and

a third component comprising a negative lens having its concave surface facing the object side, the distance on the

optical axis between said second component and said third component being greater than the distance on the optical



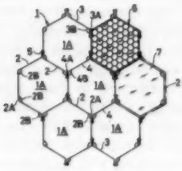
axis between said first component and said second component.

4,527,859

SUNBEAM CONCENTRATING AND COLLECTING APPARATUS

Kei Mori, No. 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Apr. 28, 1983, Ser. No. 489,403
Claims priority, application Japan, May 6, 1982, 57-75877
Int. Cl.³ G02B *7/00*
U.S. Cl. 350—252 **9 Claims**



1. A sunbeam concentrating and collecting device comprising:

(A) at least one regular polygonal holding frame comprising a plurality of angled frame segments joined together to form said holding frame;

(B) at least one lens on said holding frame; and

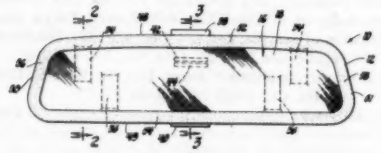
(C) adjustable means disposed in each of the included angles of said regular polygonal holding frame for supporting said at least one lens on said holding frame.

4,527,860

ANTIGLARE REAR VIEW MIRROR

James A. Roof, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1983, Ser. No. 548,925
Int. Cl.³ B60R *1/04*
U.S. Cl. 350—281 **3 Claims**



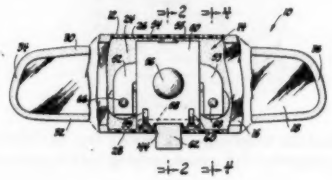
1. An antiglare rear view mirror for a vehicle comprising a housing having a back wall integrally formed with forwardly extending upper and lower flange members each of which has an aperture therein that is located along a vertical axis, said upper flange member terminating with a rim member formed with an inclined ramp portion, a mirror assembly including a mirror element having two reflecting surfaces of different reflecting power located within said housing for vertical movement between a first position and a second position, a first tab member fixed to the lower portion of said mirror element and a second tab member fixed to the upper portion of said mirror element, said first tab member extending through the aperture formed in said lower flange member and said second tab member extending through the aperture formed in said upper flange member, cooperating detent means formed on said housing and on said mirror assembly for locating said mirror element in said first position wherein one of said two reflecting surfaces is presented to a viewer and in said second position wherein the other of said two reflecting surfaces is presented to a viewer, and spring means between said housing and said mirror assembly cooperating with said detent means for maintaining said mirror assembly in said first and second positions and serving to bias said upper portion of said mirror assembly into engagement with said ramp portion of said upper flange member and bias said first tab member into engagement with said lower flange member so as to cause said mirror assembly to pivot about a horizontal axis when said mirror assembly is moved vertically between said first and second positions.

4,527,861

ANTIGLARE REAR VIEW MIRROR

Paul D. Van Duyn, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1983, Ser. No. 554,577
Int. Cl.³ B60R *1/04*
U.S. Cl. 350—281 **3 Claims**

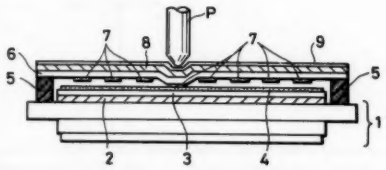


1. An antiglare rear view mirror comprising a housing supporting a mirror element having two reflecting surfaces of different reflecting powers, said housing including a back wall integrally formed with forwardly extending upper and lower flange members, said back wall having a first aperture formed therein, a second aperture formed in said lower flange member, a ball support extending through said first aperture into the interior of said housing, an actuator assembly in said housing comprising a body portion having a first part thereof contacting the rear of said ball support and a second part thereof reversely bent and contacting the front of said ball support so as to connect said body portion to said ball support for relative pivotal movement thereabout, said body portion having a pair of spring arms extending laterally therefrom and connected to said back wall for allowing said housing to pivot about a first horizontal axis relative to said body portion, an elongated cylindrical member located in a pocket formed by the reversely bent portion of said body portion for rotation about a second horizontal axis and being formed with a tab member which extends through the second aperture and is accessible for manual movement between first and second positions, a cam formed on said cylindrical member and contacting said housing whereby movement of said tab member between said first and second positions causes said cylindrical member to rotate about said second horizontal axis with resultant pivotal movement of said housing about said first horizontal axis so as to present one or the other of said reflecting surfaces to the viewer.

4,527,862
LIQUID CRYSTAL DISPLAY KEYBOARD

Kazuhiro Arakawa, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,992
Claims priority, application Japan, Dec. 3, 1982, 57-211297
Int. Cl.³ G02F 1/13
U.S. Cl. 350—334 5 Claims

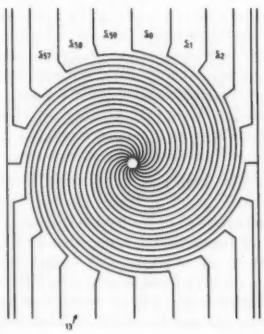


1. A liquid crystal display keyboard including a keyboard having upper and lower transparent conductive films each having transparent electrodes said keyboard being arranged on a liquid crystal display in a spaced and facing relation, characterized in that an elastic member is arranged on said upper transparent conductive film.

4,527,863
ELECTRONIC DISPLAYS

John L. Glasper, Ledbury; Ian A. Shanks, Pavenham, and Michael G. Clark, Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 12, 1983, Ser. No. 541,309
Claims priority, application United Kingdom, Oct. 14, 1982, 8229450
Int. Cl.³ G02F 1/133; G09F 9/00
U.S. Cl. 350—336 3 Claims



1. A polar coordinate plotter comprising the cooperative combination of:

a display including a set of concentric spiral electrodes and a set of radial electrodes arranged opposite one another and disposed either side of an electrically sensitive medium of dyed phase change liquid crystal material, the electrodes defining by their overlap a display area formed of a matrix of intersections;

an address signals source for providing a set of four signal waveforms V_1, V_2, V_3 and V_x;

a first multiplex address control, responsive to co-ordinate data, connected to the radial electrodes, for applying one of the two signals V_1 or V_x to each radial electrode in turn, whilst at the same time applying the signal V_x to all other radial electrodes; and,

a second multiplex address control, responsive to coordinate data, connected to the spiral electrodes, for applying to these all each in turn selected signals V_1, V_2 and V_3; the set of four signal waveforms V_1, V_2, V_3 and V_x having the following conditioned interelationships:

$$RMS(V_x - V_1) = RMS(V_x - V_2) = RMS(V_x - V_3) = V_p;$$

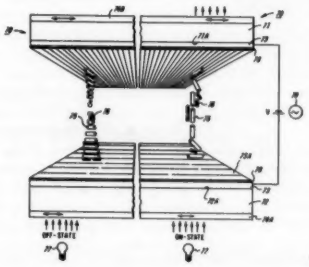
$$RMS(V_1 - V_2) = V_p; RMS(V_1 - V_3) = V_o;$$

where V_p is an upper threshold voltage, and V_o a saturation voltage, for dyed phase change hysteresis.

4,527,864
HIGH CONTRAST LIQUID CRYSTAL DISPLAY DEVICES

Gary A. Dir, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1983, Ser. No. 480,161
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.³ G02F 1/133
U.S. Cl. 350—337 6 Claims



1. A transmissive, twisted nematic liquid crystal display device comprising:

a liquid crystal cell including two transparent, insulating substrates arranged in parallel and each with a confronting surface bearing at least one transparent electrode, a layer of twisted nematic liquid crystal material having liquid crystal molecules parallel to the substrates, said layer being contained between the insulating substrates with said liquid crystal molecules being gradually twisted between the substrates, the cell being capable of transmitting light therethrough in the vicinity of the electrodes upon the application of an electric field across the layer when a potential difference of appropriate magnitude is applied between the electrodes;

a light source for directing light towards one of the insulating surfaces;

means for applying a potential difference between said electrodes and producing an electric field across said cell, when an electric field exists across the cell, said liquid crystal molecules align themselves parallel with the direction of the electric field;

a high extinction ratio polarizer being located on each insulating substrate surface opposite the ones with the electrodes for polarizing the light received from the light source, the polarizers having polarizing axes which are parallel or orthogonal to the direction of the liquid crystal molecules adjacent the insulating surface nearer to the light source, said polarizers having an extinction ratio which enables the attainment of a contrast ratio of greater

than 100 from the liquid crystal cell during passage of the main vector component of polarized light; and

a relatively small amount of dichroic dye being admixed with the liquid crystal material to form a guest-host mixture therewith, molecules of the dichroic dye being the guest molecules and being of sufficient quantity for absorbing and thus preventing the buildup and subsequent passage of an orthogonal vector component of polarized light created by imperfect rotation of the polarized light by the orientation of the twisted nematic liquid crystal molecules when no electric field is present so that the liquid crystal cell and high extinction ratio polarizers enable a density of 3 or more from said display device when no field is applied across said cell.

4,527,865

ELECTROCHROMIC DISPLAY DEVICE

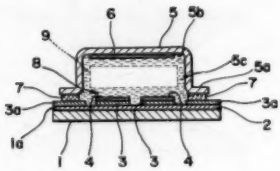
Junichi Washo, Yamatokoriyama; Takaaki Miyazaki, Nara; Mitsuo Ishii, Yamatokoriyama; Muneo Nakayama, Tokyo; Akira Hashimoto, Yokohama, and Toshihiro Nishimura, Kawasaki, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Tokyo Ohka Kogyo Co., Ltd., Kanagawa, both of, Japan

Continuation of Ser. No. 275,387, Jun. 19, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 579,006

Claims priority, application Japan, Jun. 23, 1980, 55-85385

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **1 Claim**



1. An electrochromic display device comprising a transparent substrate and a counter substrate sealingly joined together to define a cell therebetween; a transparent electroconductive layer arranged in a predetermined pattern on a surface of the transparent substrate facing the counter substrate; a display electrode layer overlaying said electroconductive layer and made of a material capable of exhibiting an electrochromic phenomenon; a counter electrode layer deposited on said counter substrate and facing seid transparent substrate; an electrolyte filled in the cell; and transparent insulating layer means for improving display definition and contrast positioned between said transparent substrate and said transparent electroconductive layer said transparent insulating layer being comprised of silicon oxide and being about 1000 Å in thickness.

4,527,866

ACOUSTO-OPTIC TRANSDUCER

Roger Bowman, Hemel Hempstead; Robert C. Peach, Harrow, and David R. J. Milverton, Berkhampstead, all of England, assignors to The Marconi Company, Limited, England

Filed Mar. 30, 1983, Ser. No. 480,394

Claims priority, application United Kingdom, Apr. 1, 1982, 8209660

Int. Cl.³ G02F *1/11*

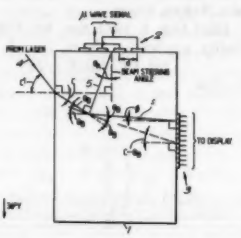
U.S. Cl. 350—358 **7 Claims**

1. A bulk wave Bragg cell comprising:

(a) a block of crystalline piezoelectric lithium niobate provided with a cut face and

(b) an interdigital transducer mounted on said cut face for generating a beam of quasi-longitudinal elastic waves in said block of crystalline lithium niobate,

wherein said face is cut substantially in the plane selected from the group consisting of 36° Y and 126° Y relative to the crystal orientation of said lithium niobate to thereby maximize the



ratio of quasi-longitudinal:quasi-shear wave piezoelectric coupling of said interdigital transducer with said lithium niobate.

4,527,867

WIDE ANGLE ZOOM LENS

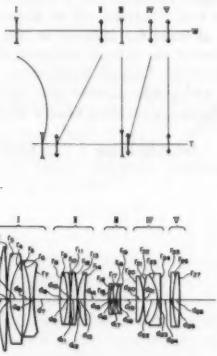
Yoshisato Fujioka, Higashikurume, and Atsushi Kawamura, Yokosuka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,581

Claims priority, application Japan, Jun. 14, 1982, 57-100656

Int. Cl.³ G02B *15/14, 9/60*

U.S. Cl. 350—427 **2 Claims**



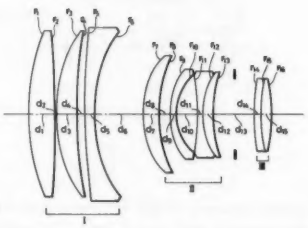
1. A wide angle zoom lens, comprising, in order from an object side, a first group of lenses having a negative focal length, a second group of lenses having a positive focal length, a third group of lenses having a negative focal length and a fourth and fifth group of lenses each of said fourth and fifth group having a positive focal length, whereby when a zoom operation is effected from a side of a short focal length to a side of a long focal length, said first group of lenses is moved in one of a first path of movement and a second path of movement wherein said first path of movement is such that said first group of lenses is first moved toward the final image plane on an optical axis in a first phase of movement and then moved toward the object in a second phase of movement and wherein said second path of movement is such that said first group of lenses is moved only towards said final image plane with each of said paths being executed in a non-linear fashion in order to correct variation of a focal position, and wherein said second group is monotonically moved towards the object to effect magnification, said third group remains immovable, said fourth group is monotonically moved towards the object at a rate relatively slower than said second group to effect magnification, and said fifth group remains immovable.

4,527,868

LARGE-APERTURE RATIO TELEPHOTO LENS SYSTEM

Shinichi Mihara, Hachiooji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 405,907, Aug. 6, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 623,548
Claims priority, application Japan, Aug. 18, 1981, 56-128137
Int. Cl.[3] G02B *13/02*
U.S. Cl. 350—454 7 Claims



1. A large-aperture ratio telephoto lens system having aperture ratio of F/2 and comprising a first converging lens group, a diverging lens group arranged with a relatively wide airspace reserved from said converging lens group, and a second converging lens group arranged with a relatively wide airspace reserved from said diverging lens group; said first converging lens group comprising a positive lens component, a positive lens component and a negative meniscus lens component having a convex surface on the object side, said diverging lens group consisting of a positive meniscus lens component having a convex surface on the object side, a negative meniscus lens component having a convex surface on the object side and a cemented doublet consisting of a positive element and a negative element, and said second converging lens group comprising at least a cemented doublet consisting of a negative element and a positive element, said large-aperture ratio telephoto lens system satisfying the following conditions (1) through (5):

$$1.0f < f_I < 1.7f \quad (1)$$

$$0.6f < |f_{II}| < 2.0f \quad (2)$$

$$0.4f < f_{III} < 0.9f \quad (3)$$

$$n_4 > 1.65 \quad (4)$$

$$n_5 < 1.55 \quad (5)$$

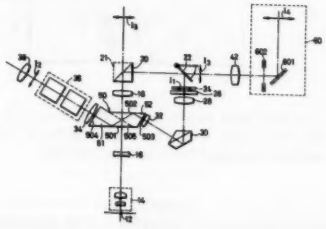
wherein the reference symbol f represents total focal length of the lens system as a whole, the reference symbol f_I designates focal length of said first converging lens group, the reference symbol f_{II} denotes focal length of said diverging lens group, the reference symbol f_{III} represents focal length of said second converging lens group, the reference symbol n_4 designates refractive index of the positive meniscus lens component arranged in said diverging lens group and the reference symbol n_5 denotes refractive index of the negative meniscus lens component arranged in said diverging lens group.

4,527,869

MICROSCOPE PROVIDED WITH A PHOTOGRAPHING DEVICE

Toshiaki Nihoshi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,549
Claims priority, application Japan, Jun. 5, 1982, 57-96845
Int. Cl.[3] G02B *21/36, 21/18*
U.S. Cl. 350—502 9 Claims



1. A microscope provided with a photographing device comprising:

(a) an objective lens system:

(b) prism means provided with a first surface opposed to said objective lens system, a second surface parallel to said first surface, a third surface having a predetermined angle with respect to said second surface and a fourth surface parallel to said third surface, said prism means introducing thereinto the emergent light from said objective lens system through said first surface and causing said light to emerge from said second surface;

(c) light guide means for causing the emergent light from said second surface of said prism means to enter said third surface, said light guide means including a plurality of reflecting members for determining the optical path of the emergent light from said second surface so that the light having entered said prism means through said third surface thereof emerges from said fourth surface one of said plurality of reflecting members of said light guide means including a roof surface having a pair of reflecting surfaces intersecting each other;

(d) change-over means operated to change the optical path determined by said light guide means and direct the emergent light from said second surface to said photographing device; and

(e) an eyepiece system for receiving the emergent light from said fourth surface of said prism means.

4,527,870

PORTABLE ILLUMINATED OPTICAL FIBER MICROSCOPE

Edward N. Esmay, Webster, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,522
Int. Cl.[3] G02B *21/06*
U.S. Cl. 350—523 8 Claims

1. A microscope for inspecting fiber optic cables, comprising:

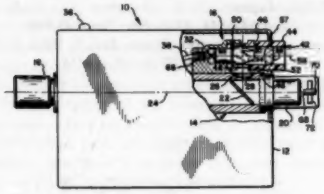
(a) a housing having an opening therein;

(b) an optical system including a first axis, and an eyepiece, a beam splitter and an objective positioned along said first axis;

(c) a light source positioned in said housing along both a second axis, which intersects said first axis at said beam splitter, and a third axis, which passes through said opening in said housing, whereby said light source is capable of providing illumination along said first, second and third axes; and

(d) a light occluder selectively positionable across said sec-

ond axis, whereby illumination from said light source is blocked from said first axis when said light occluder is in a first position across said second axis and illumination



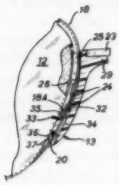
from said light source is provided along said first, second and third axes when said light occluder is in a second position removed from said second axis.

4,527,871

EYEGLASS FRAME FRONT WITH FLEXIBLE TIES

Jean-Pierre Sohyer, Dompcevrin, France, assignor to Essilor International Cie Generale d'Optique, Creteil, France

Filed Mar. 18, 1983, Ser. No. 476,795
Claims priority, application France, Apr. 1, 1982, 82 05653
Int. Cl.³ G02C *1/04, 5/12*
U.S. Cl. 351—106 **6 Claims**



1. An eyeglass frame front comprising a main suppo structure, two rims for receiving ophthalmic lenses, two nose pads for bearing against the wearer's nose, each of said rims comprising a relatively rigid upper rim member and a flexible tie member attached at its ends to said upper rim member, a pair of transverse holes provided in an inner or bridge terminal part of each of said upper rim members for receiving end portion of the associated tie member, each of said nose pads having a continuous inner surface for contact with the wearer's nose, each of said nose pads having a groove for engaging said nose pad on said inner terminal part of the associated upper rim member, a passageway continuing the groove in each of said nose pads toward the lower end thereof, said end portion of each of said tie members being threadable upwards through said passageway in the associated nose pad and then successively through each of said holes in the associated upper rim member for attachment thereto.

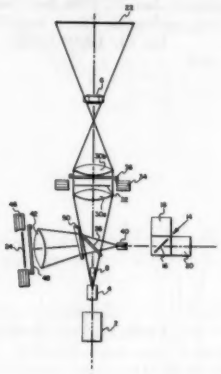
4,527,872

COMPOSITE PROCESS CINEMATOGRAPHY SYSTEM AND METHOD

Wally Gentleman, 14144 Dickens St., Apt. 208, Sherman Oaks, Calif. 91423, and John Eppolito, 1939 N. Los Robles, Pasadena, Calif. 91104

Filed Jun. 3, 1983, Ser. No. 500,859
Int. Cl.³ A63J *5/00*
U.S. Cl. 352—89 **24 Claims**

1. A composite cinematography system comprising reflective screen means; means including a projector for directing an image towards said reflective screen means; camera means having its optic axis disposed in the reflective path of said reflective screen means; focusing lens means for focusing the reflected image from said reflective screen means to a plane disposed in said reflective path and along said optic axis; two spaced lenses disposed in said reflective path, along said optic axis, and to either side of said plane for providing a reduced aerial image of said reflected image at said plane; and object



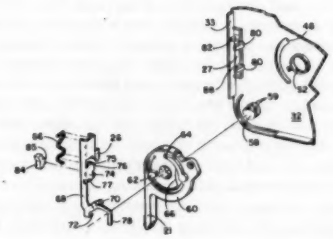
supporting means disposed in said reflective path, along said optic axis, and between said spaced lenses for supporting an object adjacent said plane to form a composite image for photographing by said camera means.

4,527,873

CAMERA LOADING DOOR INTERLOCK

John H. Alligood, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1984, Ser. No. 604,251
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—121 **5 Claims**



1. In a camera arranged to accept a film cartridge with a dark slide which is movable independently of the film, said camera having a cartridge loading door, a latch member arranged to engage said door when said door is in a closed position, spring means for urging said latch member into engagement with said door, a movable dark slide-engaging lever, and a movable actuating member operatively connected to said dark slide-engaging lever, the improvement comprising:

disengaging means on said actuating member for positively engaging said latch member and for moving said latch member against the force of said spring means into a disengaged position for disengaging said door after said actuating member has first moved said dark slide-engaging lever to close said dark slide;

a retainer means for holding said latch member in said disengaged position, said retainer means being engageable by said door only when said door is closed for releasing said latch member from said disengaged position whereby said door is engaged by said latch member and held closed; and

interlock means on said actuating member cooperating with said latch member for preventing movement of said actuating member to open said dark slide until said door is engaged by said latch member and for positively engaging said latch member when said dark slide is open to pull said latch member into positive engagement with said door.

4,527,874

DUAL LENS CAMERA

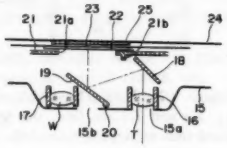
Hiroshi Ohmura, c/o Fuji Photo Film Co., Ltd., 2-26-30, Nishiazabu, Minato-ku, Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 589,012

Claims priority, application Japan, Mar. 18, 1983, 58-38348[U]

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—195.12 **8 Claims**



1. A dual lens camera which is provided with a relatively long focus lens and a relatively short focus lens which are arranged side by side and either one of which is selected, an exposure aperture located behind said short focus lens, a fixed mirror located behind said long focus lens, a movable mirror which is pivotally movable between a first position where it positions in front of said exposure aperture and a second position where it positions out of the front of said exposure aperture, said movable mirror organizing an optical path for said long focus lens at said first position to direct the light reflected by said fixed mirror to said exposure aperture and another optical path for said short focus lens at said second position to allow the light passed through said short focus lens travel straightly to said exposure aperture, the improvement characterized in that said fixed mirror is so inclined as to turn a optical path of said long focus lens at an angle less than a right angle; and said movable mirror at said first position is parallel to said fixed mirror so as to organize a Z-shaped optical path for said long focus lens.

4,527,875

ILLUMINATED FINDER

Shunichi Shibata, deceased, late of Tokyo, Japan (by Towa Shibata, legal representative), assignor to West Electric Company, Ltd., Osaka, Japan

Filed Jul. 6, 1983, Ser. No. 511,352

Claims priority, application Japan, Jul. 6, 1982, 57-117208

Int. Cl.³ G03B *13/08*

U.S. Cl. 354—225 **3 Claims**

1. An illuminated finder comprises:

(1) a first optical system for looking at an image of an object, comprising:

a first window for taking in a first light from a direction of said object,

a finder object lens for leading said first light inside a camera body through said first window,

an eye lens disposed on a rear part of a camera and

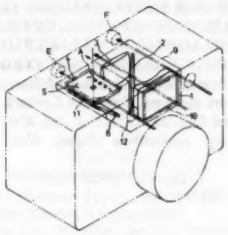
a half reflection mirror disposed in a first light path between said finder objective lens and said eye lens,

(2) a second optical system which comprising:

a second window through which top light as a second light is taken inside said camera body,

a frame sheet having a view frame, through which said second light passes, said second light entering inside said camera body through said second window, and

a reflection mirror for leading said second light incident through said frame sheet to said eye lens in a second light path via said half reflection mirror,



whereby said second optical system making said view frame overlapping on said image of said object at said half reflection mirror, and

(3) a photographing information indicator disposed on said second window at least a part of which covers at least a part of said second window.

4,527,876

EXPOSURE CONTROL SHUTTER OF A CAMERA

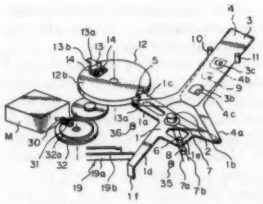
Harumi Tanaka, Kobe, and Takashi Iwata, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 7, 1983, Ser. No. 539,829

Claims priority, application Japan, Oct. 13, 1982, 57-179445; Jan. 14, 1983, 58-4857; Jan. 27, 1983, 58-12145

Int. Cl.³ G03B *9/14, 9/40*

U.S. Cl. 354—229 **14 Claims**



1. An exposure control shutter of a camera having an exposure opening, wherein said shutter comprises: first and second plane shutter blades, each shutter blade having a relatively large aperture and a relatively small aperture, said shutter blades being disposed one on top of the other and being slidingly movable with respect to each other from a neutral position to either a first exposure position or a second exposure position, said shutter blades cooperating to close said camera exposure opening in said neutral position, said shutter blades being simultaneously moved in one direction and then in the opposite direction from said neutral position to said first exposure position in which said relatively large aperture of said shutter blades meet in said camera exposure opening to define a low-speed, large-aperture-size exposure, and said shutter blades being also simultaneously moved in a reverse direction from said neutral position to said second exposure position in which said relatively small apertures meet in said camera exposure opening to define a high-speed, small-aperture-size exposure; means for biasing said first and second shutter blades to maintain them in said neutral position; means for simultaneously actuating said first and second shutter blades against said bias means so as to move them selectively to said first

exposure position or second exposure position and simultaneously release them to said neutral position; and means for guiding said first and second shutter blades during the movement thereof.

4,527,877

DEVICE FOR DETECTING THE TIME OF TERMINATION OF OPENING OPERATION OF SHUTTER BLADES OF AN ELECTROMAGNETIC PROGRAMMING SHUTTER

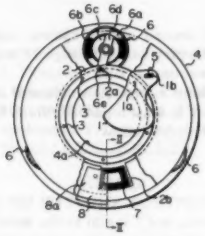
Tomio Kurosu, Iwatsuki, and Yukio Yoshikawa, Tokyo, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,629

Claims priority, application Japan, Oct. 27, 1981, 56-159801[U]

Int. Cl.³ G03B 9/08

U.S. Cl. 354—234.1 **10 Claims**



1. Device for detecting the termination of the opening operation of shutter blades of an electromagnetic programming shutter in which at least one of the opening operation and the closing operation of said shutter blades is electromagnetically controlled, comprising:

a rotatable sector ring connected to said shutter blades,

an induction coil secured to said rotatable sector ring,

a permanent magnet secured to a base plate in facing relationship to said induction coil, and

a detecting circuit for detecting the vanishing of the electric current induced in said induction coil resulting from the termination of the relative movement between said induction coil and said permanent magnet at the time of termination of the opening operation of said shutter blades after said shutter blades have initiated the opening operation from the closed positions for causing the relative movement between said induction coil and said permanent magnet so as to generate the induced electric current in said induction coil, thereby permitting the time of termination of the opening operation of said shutter blades to be detected by said detecting circuit.

4,527,878

METHOD AND APPARATUS FOR CONTROLLING ACTIVITY OF DEVELOPING SOLUTION AGAINST OXIDATION BY USING A TEST PIECE

Hiroshi Taniguchi, Uji; Nobuhiro Takita; Norimasa Nomura, both of Kyoto, and Masaji Mizuta, Uji, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 6, 1982, Ser. No. 395,699

Claims priority, application Japan, Jul. 20, 1981, 56-113219; May 24, 1982, 57-87593

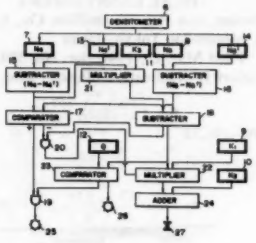
Int. Cl.³ G03D 13/00; G01N 21/59

U.S. Cl. 354—298 **7 Claims**

1. A method for controlling the activity of a developing solution against oxidation by using a test piece, for use in an automatic developer, comprising the steps of:

(a) obtaining differences N_4-N_4' and N_5-N_5' between first and second standard densities N_4 and N_5 measured at predetermined first and second points of a first test piece which has been developed in a standard developing solution, and densities N_4' and N_5' measured at points of a second test piece of the same type as the first test piece and which corresponds to said predetermined points of the first test piece, said second test piece having been developed in a developing solution to be controlled;

(b) calculating an operating time T of constant-flow supplementing means which supplements a supplementary solution to the developing solution to be controlled, according



to a formula $T=K_1[K_3(N_4-N_4')-(N_5-N_5')]+K_2$ wherein K_1, K_2 and K_3 are first, the second and third predetermined factors dependent on the test pieces and developing solutions; and

(c) actuating the constant-flow supplementing means for thus the obtained operating time T, thereby supplementing the supplementary solution to the developing solution to be controlled in order to restore its activity.

4,527,879

CAMERA SYSTEM

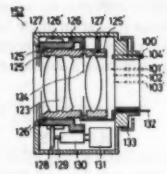
Kazuya Hosoe, Kunitachi, and Takao Kinoshita, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 313,582, Oct. 21, 1981, abandoned. This application Jul. 16, 1984, Ser. No. 631,008

Claims priority, application Japan, Oct. 23, 1980, 55-149062

Int. Cl.³ G03B 3/00

U.S. Cl. 354—400 **21 Claims**



1. A camera system comprising:

(A) a camera main body having:

(A-1) a section for mounting a photographic lens assembly,

(A-2) view finder means for viewing a field through a photographic optical system in said photographic lens assembly mounted to said mounting section,

(A-3) a focus detecting device for detecting a focusing state of said photographic optical system in said photographic lens assembly mounted to said mounting section, said focus detecting system generating an electric output signal representing the focusing state of said photographic optical system,

(A-4) displaying means for displaying the focusing state of said photographic optical system in said photographic lens assembly mounted to said mounting section in response to the output signal generated by said focus detecting device,

(A-5) contact means for transmitting the output signal

generated by said focus detecting device to outside of said camera main body,

(A-6) a shutter device for photography,

(A-7) single manually operable means for both actuating said focus detecting device and releasing of said shutter device,

(A-8) a section which accommodates a power source for supplying power to said focus detecting device, and

(A-9) power source contact means for transmitting power from said power source accomodated in said accommodating section to outside of said camera main body; and

(B) photographic lens assemblies of first and second types selectively used with said camera main body, said photographic lens assemblies of first and second types respectively including,

(B-1) mounting means for mounting said photographic lens assembly to said mounting section of said camera main body, and

(B-2) a photographic optical system which can be focused, said photographic lens assembly of first type further comprising,

(B-13) manually operable means for manually focusing said photographic optical system, and

said photographic lens assembly of second type further comprising,

an automatic focusing device for automatically focusing said photographic optical system based on the output signal from said focus detecting device of said camera main body,

(B-24) contact means connectable to said contact means of said camera main body means, for transmitting the output signal from said focus detecting device of the camera main body to said automatic focusing device, and

(B-25) power source contact means, which is connectable to said power source contact means of said main camera body, for supplying power from said power source accommodated in said accommodating section of said camera main body to said automatic focusing device.

4,527,880

FLASH DEVICE AND/OR PHOTOGRAPHIC APPARATUS USABLE WITH THE SAME

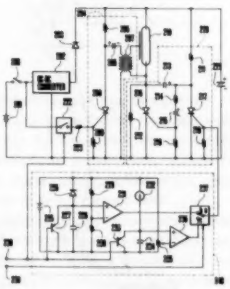
Tadashi Okino, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Dec. 19, 1983, Ser. No. 562,705

Claims priority, application Japan, Dec. 25, 1982, 57-234820

Int. Cl.³ G03B *3/00, 7/00*

U.S. Cl. 354—403 **17 Claims**



4. A photographic system comprising in combination:

(A) a focus adjustable image forming optical system for forming an image of an object on a predetermined focal plane;

(B) automatic focusing means for automatically focusing said optical system on the object;

(C) focus lock means for locking the focus of said optical system;

(D) flash means for emitting a flash to illuminate the object;

(E) first control means for controlling the amount of flash irradiating the focal plane on the basis of the flash emitted from said flash means and reflected back from the object;

(F) second control means for controlling the amount of flash irradiating the focal plane on the basis of an information on the distance to the object; and

(G) selection means for selecting said second control means when said focus lock means is enabled.

4,527,881

PHOTOMETRIC DEVICE

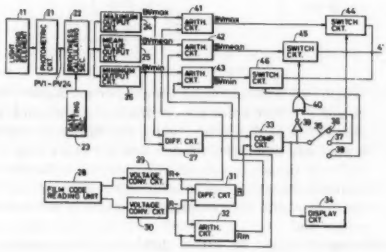
Saburo Sugawara, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 626,076

Claims priority, application Japan, Jul. 29, 1983, 58-138763

Int. Cl.³ G03B *7/28, 7/08*

U.S. Cl. 354—432 **4 Claims**



1. A photometric device, comprising:

a light-sensing element for providing independent photometric outputs from a plurality of field regions which form a photographic field;

means for producing signals representing a mean value, a maximum value and a minimum value of the photometric outputs of said light-sensing element;

a reading unit for reading a latitude of a photosensitive material;

comparison circuit means for comparing a difference value between said maximum and minimum values of said photometric outputs with said latitude; and

exposure mode select switch means for selecting one of said photometric outputs as a photometric reference according to a result of comparison between said difference value between said maximum and minimum values and said latitude.

4,527,882

DISPLAY APPARATUS FOR AUTOMATIC EXPOSURE CONTROL CAMERA

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 438,469, Nov. 2, 1982, abandoned. This application Oct. 26, 1984, Ser. No. 665,086

Claims priority, application Japan, Nov. 6, 1981, 56-178095; Nov. 6, 1981, 56-178096

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—442 **5 Claims**

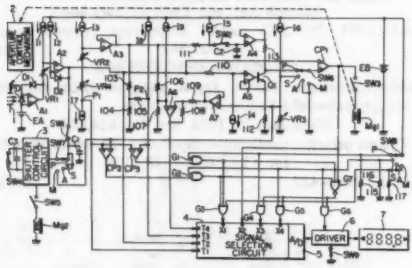
1. In a display apparatus for use in a camera in which an aperture can be controlled within a predetermined control range based on an exposure time value preset to obtain an optimum exposure, the improvements comprising:

(a) control means for setting the aperture to a determined

aperture value and controlling an exposure time value based on said determined aperture value if an aperture value which can provide an optimum exposure based on said preset exposure time value is out of said determined control range;

(b) detection means for determining whether or not said aperture value for optimum exposure is within said predetermined control range and generating a detection signal according to the result;

(c) selection means for selectively generating either of two different signals according to said detection signal, one of



which two different signals is an aperture signal indicative of said aperture value for optimum exposure and is generated when said aperture value for optimum exposure is within said determined range, and the other of which two different signals is a shutter speed signal indicative of said controlled exposure time value and is generated when said aperture value for optimum exposure is not within said range; and

(d) display means for either displaying said aperture value for optimum exposure when said aperture signal is introduced thereto or displaying said controlled shutter speed value when said shutter speed signal is introduced thereto.

4,527,883

MOUNTING STRUCTURE FOR CYLINDRICAL PHOTOSENSITIVE MEMBER

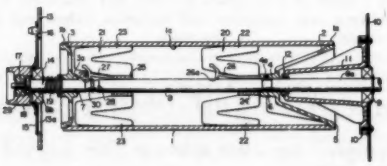
Shin-ichi Kamiyama, Kanagawa, Japan, assignor to Ricoh Company Ltd., Japan

Filed Jul. 16, 1982, Ser. No. 398,789

Claims priority, application Japan, Jul. 17, 1981, 56-106214[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DR **6 Claims**



1. A mounting structure for mounting a cylindrical photosensitive member on a support shaft; comprising

a support shaft which has its one end carried by a frame;

a stationary end plate mounted on said end of the support shaft and disposed for receiving, by a fitting engagement, one end opening of a cylindrical photosensitive member as the latter is brought to its normal mounting position on the support shaft;

a movable end plate detachably mounted on the support shaft for receiving, by a fitting engagement, the other end opening of the photosensitive member when the latter has been brought to its normal mounting position on the support shaft;

a guide and support member disposed for free movement on the support shaft, the guide and support member being configured for resilient contact with the inner peripheral surface of the photosensitive member to support it with respect to the support shaft and being adapted for axial movement along the support shaft as the photosensitive member moves axially with respect to the support shaft; and

stop means mounted on the support shaft for limiting the movement of the guide and support member to an extent which is effective for allowing a mounting or dismounting of the cylindrical photosensitive member onto or from the support shaft.

4,527,884

DEVICE FOR INKING AN ELECTROSTATIC CHARGE IMAGE WITH TONER PARTICLES

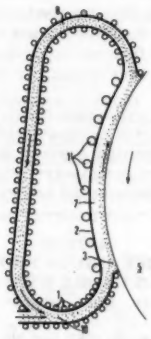
Alban Nusser, Freising, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

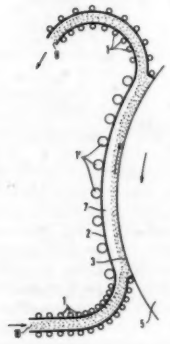
Filed Sep. 1, 1982, Ser. No. 413,748

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138507

Int. Cl.³ G03G *15/06, 15/08, 15/09, 15/00*

U.S. Cl. 355—3 DD **21 Claims**





1. A device for inking an electrostatic charge image on a moving information carrier with electrically charged toner particles by means of aerosol formation, comprising at least one feed channel, at least one discharge channel, and at least

one developing gap for receiving at least a portion of said formation carrier disposed therein and said gap being in communication with said feed channel and said discharge channel, said feed channel, developing gap and discharge channel having an excitation layer having a series of electrodes, means for supplying said electrodes with an alternating voltage for generating a nonhomogeneous electrical alternating field in the developing gap, in the feed channel, and in the discharge channel for transferring said toner particles in the form of a toner powder cloud through said feed channel, said developing gap, and said discharge channel in a direction opposite to movement of said information carrier.

21. A device for inking an electrostatic charge image on an information carrier with electrically charged toner particles by means of aerosol formation, comprising at least one feed channel, at least one discharge channel, and at least one developing gap having at least a portion of said information carrier disposed therein and communicating with said feed channel and said discharge channel, and a means for generating an air flow for transporting said toner particles through said feed channel, said developing gap, and said discharge channel.

4,527,885

IMAGE RECORDING SYSTEM HAVING MULTIPLE IMAGE RECORDING MEANS

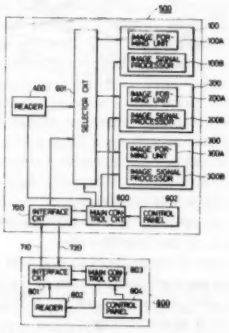
Naoki Ayata, Machida; Seiji Saito, Yokosuka; Hidetoshi Suzuki; Kunitaka Ozawa, both of Tokyo, and Noboru Koumura, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,082

Claims priority, application Japan, Jul. 15, 1981, 56-109290; Jul. 23, 1981, 56-114350; Jul. 31, 1981, 56-119160

Int. Cl.³ G03G *15/00;* **H04N** *1/00*

U.S. Cl. 355—3 R **21 Claims**



1. An image recording system, comprising:

a plurality of input means each for independently entering different image information into said system;

a plurality of recording means each capable of recording, on a recording sheet, image information entered by any of said plurality of input means; and

means for supplying image information entered by any of said plurality of input means selectively to at least one of said plurality of recording means; said supplying means further being operative, when a new recording requirement from at least one of said input means occurs during the recording operation of at least one of said plurality of recording means, for supplying image information entered from at least one of said input means to another recording means which is not then performing the image recording operation.

4,527,886

ELECTROPHOTOGRAPHIC RECORDING APPARATUS HAVING BOTH FUNCTIONS OF COPYING AND PRINTING

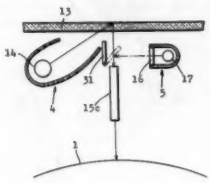
Kazuo Inamori, and Katsuhiko Gotoda, both of Kyoto, Japan, assignors to Kyoto Ceramic Co., Ltd., Japan

Filed May 5, 1982, Ser. No. 375,042

Claims priority, application Japan, May 12, 1981, 56-71880; May 12, 1981, 56-71881; May 12, 1981, 56-71882; May 25, 1981, 56-79885; May 25, 1981, 56-79886; Jun. 5, 1981, 56-87368; Jun. 5, 1981, 56-87387

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **16 Claims**



1. An electrophotographic recording apparatus having both functions of copying and printing comprising:

a photosensitive member having photosensitivity to electrical charging in both positive and negative polarities,

an electrical charging unit for uniformly charging the surface of said photosensitive member selectively in either positive or negative polarity,

a first changeover means for changing the charging polarity of the photosensitive member in accordance with a copying mode and a printing mode,

an exposure unit for the copying mode including an optical system which projects onto the surface of said charged photosensitive member an optical image corresponding to an image of an original placed on an original support table,

an optical image scanning unit for the printing mode for irradiating onto the surface of said charged photosensitive member a recording region corresponding to a record signal,

a second changeover means for changing operations of said exposure unit and optical image scanning unit in accordance with the copying mode and printing mode,

a single developing unit for developing an electrostatic latent image formed on the surface of said photosensitive member, said developing unit having a toner of a predetermined polarity so as to effect an ordinary development of the electrostatic latent image formed by the operation of said exposure unit for the copying mode and effect a reversal development of the electostatic latent image formed by the operation of said optical image scanning unit for the printing mode, and

a transfer unit being applied voltage of the polarity opposite to the polarity of the toner so as to transfer the developed image onto a recording member.

4,527,887

BLADE CLEANER FOR A CHARGE-RETENTIVE SURFACE

John E. Vineski, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,160

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **9 Claims**

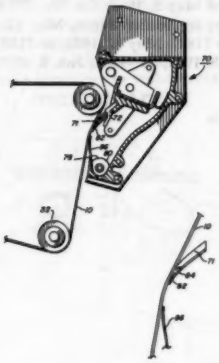
1. Printing apparatus comprising:

a charge-retentive surface;

means including toner for forming visible images on said charge-retentive surface;

a cleaning blade;

means for supporting at least one edge of said cleaning blade in contact with said charge-retentive surface such that powder developing material loosened by said cleaning blade tends to fall away from residual said charge-retentive surface; and



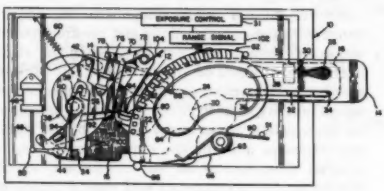
means carried by said supporting means for preventing said toner loosened by said cleaning blade from falling away from said charge-retentive surface so that it is collected adjacent said at least one edge, said at least one edge thereby becoming immersed in toner whereby powder clouding is precluded.

4,527,888

EXPOSURE CONTROL SYSTEM FOR PHOTOGRAPHIC CAMERA APPARATUS

George D. Whiteside, Lexington; Laura E. Keith, Reading, and Donato F. Pizzuti, Lynnfield, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 23, 1984, Ser. No. 573,020
Int. Cl.³ G03B *3/10, 9/14*
U.S. Cl. 354—400 **5 Claims**



1. An exposure control system for a camera apparatus having means for defining a focal plane comprising:

a shutter blade mechanism;

means for mounting said blade mechanism for displacement between at least one arrangement wherein it blocks scene light from reaching the focal plane and another arrangement wherein it defines a maximum size aperture, said blade mechanism serving to define a range of progressively increasing sized apertures for admitting scene light to the camera focal plane as it moves from its said scene light blocking arrangement toward its maximum size aperture defining arrangement;

an objective lens arrangement;

means for mounting at least part of said objective lens arrangement for displacement between a plurality of focal positions, said objective lens arrangement being adapted to focus an image of a subject located at a different distance from said camera within a given range of distances at the focal plane of said camera at each of its said focal positions; and

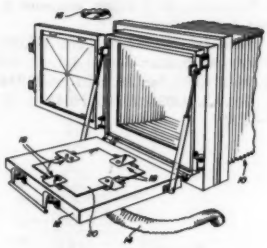
means for latching said shutter blade mechanism and said objective lens arrangement so as to inhibit either displacement of said shutter blade mechanism or said objective lens arrangement, said latching means being displaceable between a first position wherein said latching means is engaged with said shutter blade mounting means so as to inhibit displacement of said shutter blade mechanism from said one scene light blocking arrangement toward said other maximum size aperture defining arrangement and disengaged from said objective lens arrangement to permit the displacement thereof, and a second position wherein said latching means is disengaged from said shutter blade mounting means to permit the displacement thereof and engaged to said objective lens arrangement to prevent the displacement thereof.

4,527,889

RE-REGISTER ANCHORS FOR FILM SHEET

John N. Ghougasian, 2660 Kings Bridge Ter., Bronx, N.Y. 10463

Filed Jan. 6, 1984, Ser. No. 569,249
Int. Cl.³ G03B *27/32*
U.S. Cl. 355—77 **3 Claims**



1. The method of attaining precise registry of a first film sheet (to be exposed on a camera back and subsequently removed therefrom and developed) with a second subsequently partially exposed film sheet stationarily supported from the camera back, said method comprising:

A. providing an opening in at least two remote marginal panel portions of the first film sheet;

B. attaching a pair of tab anchors to said film sheet including registry posts supported therefrom of a size to be snugly received in said openings and of a length to project slightly through said openings;

C. releasably randomly attaching said tab anchors, while the latter remain attached to said first film sheet, to said camera back while the latter is open;

D. closing said camera back;

E. exposing said first film sheet;

F. opening said camera back;

G. removing said first film sheet from said tab anchors while the latter remain releasably attached to said camera back;

H. stationarily supporting a second film sheet on said camera back;

I. closing said back;

J. partially exposing said second film sheet;

K. opening said back;

L. developing said first film sheet between steps G and L; and

M. re-mounting said first film sheet on said back over said second film sheet through the use of said tab anchors.

4,527,890

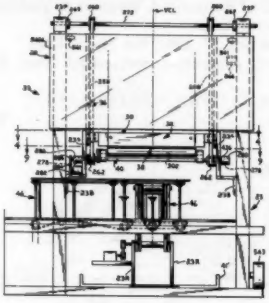
AUTOMATIC REPETITIVE REGISTRATION AND IMAGEWISE EXPOSURE OF SHEET SUBSTRATES

Robert B. Heiart, Middletown, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 387,534, Jun. 11, 1982,. This application Aug. 15, 1983, Ser. No. 523,357

Int. Cl.[3] **G03B** *27/30*

U.S. Cl. 355—100 **24 Claims**



1. A substrate exposure apparatus comprising:

a framework:

means for registering a photomask with respect to substrate with a photosensitive layer;

optional means for displacing the registered substrate and photomask with respect to the framework to an exposure position;

means for exposing the photosensitive substrate;

a laminator means for laminating the photomask to the surface of the substrate with the photosensitive layer optionally as the substrate and the photomask are displaced to the exposure position including means for applying pressure to the substrate with a photosensitive layer and the photomask to allow contact through a liquid layer;

means for applying relative movement between (a) the substrate with the photosensitive layer and the photomask and (b) means for applying pressure; and

an applicator for applying a liquid positioned adjacent at least one of the surfaces of the photosensitive layer and the photomask whereby an excess of liquid can be obtained at a nip where the photosensitive layer and photomask contact one another through the liquid.

4,527,891

RANGEFINDER DEVICE WITH SERIAL READOUT LINEAR IMAGE SENSOR AND PEAK DETECTOR WITH THRESHOLD SETTING MEANS

David N. Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,258

Int. Cl.[3] **G01C** *3/10;* **G03B** *7/08*

U.S. Cl. 356—1 **8 Claims**

1. A rangefinder device, comprising:

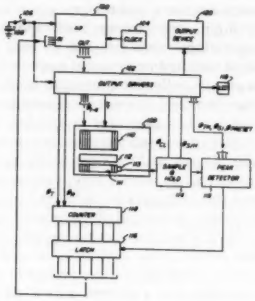
means for projecting a beam of light for illuminating a spot on an object in a scene;

linear image sensor means for viewing the scene and producing in response to periodic scanning signals, a series of photosignals representing the brightness of the scene; and

signal processing means responsive to said series of photosignals for detecting the relative location of said spot in said scene and producing a distance signal in response thereto, said signal processing means including:

counter means, advanced in synchronism with said scanning signals for producing a running count representative of the number of photosignals produced by said image sensor;

latch means connected to said counter means and responsive to a latch signal for capturing and temporarily holding the current count at the time of receipt of said latch signal; and



peak detector means, responsive to said series of photosignals for producing a latch signal each time a new greater photosignal is produced by said image sensor means, said latch signal being supplied to said latch means, whereby, after said series of photosignals has been produced by said image sensor, the count held by said latch means represents the location of the image of said spot on said image sensor.

4,527,892

DISTANCE MEASURING APPARATUS

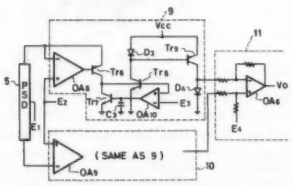
Satoshi Yamane, Kobe, and Toshitatsu Suzuki, Takarazuka, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Dec. 1, 1982, Ser. No. 446,006

Claims priority, application Japan, Dec. 1, 1981, 56-193046

Int. Cl.[3] **G01C** *3/00*

U.S. Cl. 356—1 **8 Claims**



1. A distance measuring apparatus for measuring the distance from a reference point to a subject of interest comprising:

means for radiating an energy beam toward said subject of interest;

receiving means for receiving the energy beam reflected from said subject, said receiving means including a receiving surface defined between two extreme points and supplying first and second current signals the magnitude of each of which is determined by the location of impingement of said reflected energy beam within and with respect to said two extreme points;

first extracting means to which said first current signal is supplied to extract a first fluctuating component from said first current signal thereby eliminating the effect of background light;

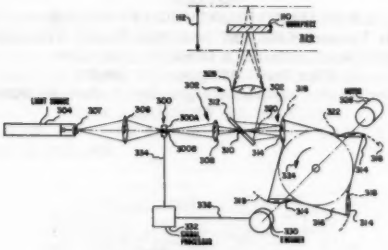
second extracting means to which said second current signal is supplied to extract a second fluctuating component from said second current signal thereby eliminating the effect of background light; and

a differential processing means to which said first and second fluctuating components are supplied to obtain a distance signal by taking a difference between said first and second fluctuating components; thereby each of said first and second extracting means including a first operational amplifier having its first input connected to receive said first or second current signal and its second input connected to receive a first reference potential, a first transistor having its emitter connected to said first input of said first operational amplifier and its base connected to the output of said first operational amplifier, a second transistor having its collector connected to the collector of said first transistor and its emitter connected to a second reference potential, a capacitor connected between the base and emitter of said second transistor, a second operational amplifier having its first input connected to a third reference potential, its second input connected to the junction between the collectors of said first and second transistors and its output connected to the base of said second transistor, a third transistor having its base connected to the junction between the collectors of said first and second transistors and its emitter connected to said second reference potential and a current mirror circuit connected to the collector of said third transistor for supplying said first or second fluctuating component at the output of said first or second extracting means.

4,527,893
METHOD AND APPARATUS FOR OPTICALLY MEASURING THE DISTANCE TO A WORKPIECE

Francis M. Taylor, 1620 Charlton Mill Rd., Xenia, Ohio 45385

Filed Oct. 13, 1982, Ser. No. 434,200
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—4 **13 Claims**



1. A method for measuring the position of a workpiece within a zone of measurement comprising the steps of:

moving a specular surface within the object space of a lens system;

forming said specular surface to substantially define an involute curve;

mounting said specular surface for rotation such that the optical axis of said lens system is centered upon the tangent to a generating circle of said involute curve when said specular surface is rotated about the center of said involute generating circle;

rotating said specular surface to sweep repeatedly the image space of said lens system through a corresponding distance which defines said zone of measurement;

determining the dimensions of the object space as said image space is swept;

positioning a light source as an object along the optical axis of said lens system;

positioning a light detecting element to receive light retroreflected through said lens system and to generate an electrical signal representative of the light incident thereon;

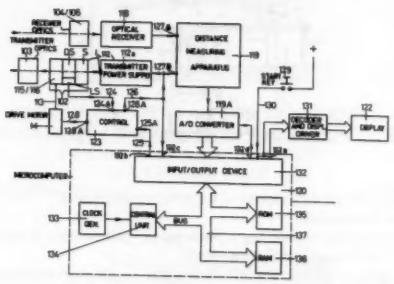
monitoring the electrical signal generated by said light detecting element to detect the minimum of said electrical signal which corresponds to the point of focus of the image of said light source upon said workpiece; and

coordinating the point of image focus and the corresponding object space dimension to define the position of said workpiece within said zone of measurement.

4,527,894
METHOD AND APPARATUS FOR MEASURING THE VELOCITY OF MOVED OBJECTS OR THE LIKE

Simon Goede, Wetzikon; Peter Hauser, Uster, and Silvio Mira, Wermatswil, all of Switzerland, assignors to Zellweger Uster Ltd., Uster, Switzerland

Filed Sep. 27, 1982, Ser. No. 424,920
Claims priority, application Switzerland, Dec. 17, 1981, 8062/81
Int. Cl.³ G01P *3/36;* **G01C** *3/08*
U.S. Cl. 356—28 **22 Claims**



1. A method of measuring the velocity of a moving object by means of pulsed optical radiation, comprising the steps of:

forming at least one measuring beam from a sequence of optical pulses;

directing said at least one measuring beam towards the object whose velocity is to be measured;

determining the transit times of the at least one measuring beam to the object and its reflection at the object back to a site where the at least one measuring beam was transmitted;

forming distance values from the determined transit times and distance differences from the distance values;

dividing the distance differences by related time spans in order to form velocity values of the moving object to be measured;

selecting at least one of said time spans during which substantially constant values are formed of said velocity of the moving object and thus determining a reliable velocity value; and

displaying said reliable velocity value.

4,527,895
METHOD OF CHARACTERIZING THE COLORED APPEARANCE OF A GEMSTONE

Howard Rubin, Bayside, N.Y., assignor to GemDialogue Systems, Inc., Bayside, N.Y.

Filed Jan. 25, 1983, Ser. No. 460,761
Int. Cl.³ G01J *3/52;* **G01N** *21/87*
U.S. Cl. 356—30 **14 Claims**

1. In a procedure for uniformly and uniquely designating the physical characteristics of a colored gemstone, a method of specifying colors of the gemstone comprising the steps of:

illuminating the gemstone with a light source of predetermined intensity and spectral characteristics so as to enable viewing of at least a portion of the interior of the gemstone;

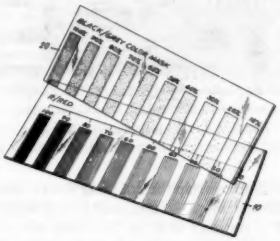
viewing the illuminated gemstone to identify the main color thereof from among a predetermined set of primary colors situate along the spectrum of visible light;

viewing the illuminated gemstone to identify the overlay

color thereof from among said predetermined set of primary colors;

said steps of identifying the main and overlay colors including the step of comparing the illuminated gemstone with a series of color charts comprising said predetermined set of primary colors and mixtures of the primary colors to select the color chart corresponding to the combination of main and overlay colors present in the gemstone;

determining the degree of color masking in the gemstone by overlaying one atop the other a color mask and the selected color chart corresponding to the main and overlay colors of the gemstone and comparing the gemstone with



said overlaid combination, said color mask comprising a masking chart containing uniformly increasing amounts of masking in a relatively neutral color not included in said predetermined set of primary colors, and identifying by said comparison the amount of masking which, when overlaid with the selected color chart corresponding to the main and overlay colors of the gemstone, approximates the total colored appearance of the gemstone;

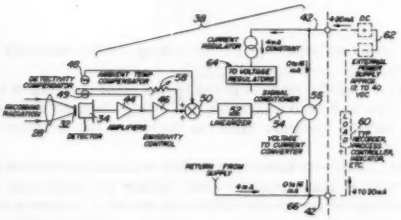
whereby the selected combination of main and overlay colors and of color mask amount uniquely identifies the total color characteristics and appearance of the gemstone such that the gemstone can be readily matched with another, given the elements of the identified combination.

4,527,896

INFRARED TRANSDUCER-TRANSMITTER FOR NON-CONTACT TEMPERATURE MEASUREMENT

Keikhosrow Irani, Franklin Lakes, and Michael G. MacBurney, Chatham, both of N.J., assignors to Mikron Instrument Company, Inc., Wyckoff, N.J.

Filed Mar. 4, 1982, Ser. No. 354,605
Int. Cl.³ G01J *5/18, 5/26, 5/32*
U.S. Cl. 356—43 **12 Claims**



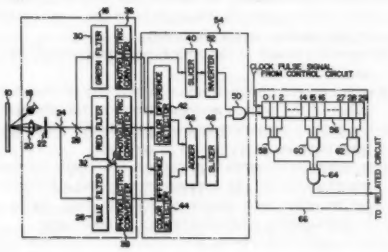
1. Transmitter-transducer apparatus for non-contact temperature measurement wherein there is provided, on the same two wires, both a power supply current for the apparatus and an output signal current representative of a sensed target temperature, said apparatus comprising a housing, an opening in said housing for admitting to said housing radiation from a target object, optical means disposed in said opening in axial alignment with said opening, radiation detector means disposed in said housing in optical alignment with said optical means and adapted to receive radiation transmitted by said optical means, and signal processing means disposed in said housing and adapted to receive from said radiation detector means an electrical detector signal responsive to radiation incident on said radiation detector means, said signal processing means including means to amplify and linearize the signal to produce an output which is linearly proportional to the temperature of a target object, and a two-wire lead electrically connected to said signal processing means and adapted to be electrically connected to a remote power supply and a load, power supply regulator means operatively connected to said lead to supply to said apparatus a constant input current, and elecrical circuit means for summing said input current and the output current of said signal processing means to produce the output current of the apparatus, said lead being electrically connected to said circuit means whereby both the power supply current for the apparatus and the output signal current are carried by said lead.

4,527,897

APPARATUS FOR DETECTING SPECIFIC COLOR

Yoshie Okabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 14, 1982, Ser. No. 418,003
Claims priority, application Japan, Sep. 18, 1981, 56-147209
Int. Cl.³ G01J *3/50*
U.S. Cl. 356—407 **4 Claims**



1. An apparatus for detecting specific color comprising:

color resolving means illuminating a color pattern printed on a predetermined background and resolving the reflected light into a plurality of color components with a specific color filter capable of passing light of a specific color and at least one color filter capable of passing light of a different color;

photoelectric converter means including a plurality of photoelectric converters connected to said filters of said respective color resolving means filters for converting said color components into corresponding electric signals;

specific color discriminating means connected to the photoelectric converter converting the specific color into a corresponding electric signal for producing a logic "1" signal when the signal representing the specific color is supplied;

color difference detecting means connected to said plurality of photoelectric converters for taking the difference between the electric signal concerning said specific color and electric signals concerning other color components to thereby increase the amplitude of the other color component electric signals;

slicer means connected to said color difference detecting means for providing a logic "1" signal when a signal produced from said color difference detecting means is above a predetermined level determined on the basis of said specific color and other color components; and

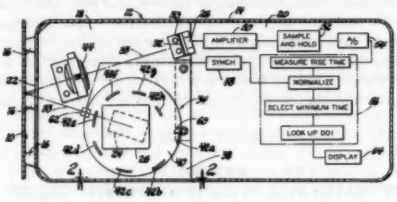
AND gate means connected to said specific color discriminating means and also to said slicer means for producing a specific color signal indicative of the detection of said specific color when both said means simultaneously provide logic "1" signals.

4,527,898

DISTINCTNESS OF IMAGE METER

Thomas T. Stapleton, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1982, Ser. No. 453,626
Int. Cl.³ G01N *21/55, 21/57*
U.S. Cl. 356—446 **2 Claims**



1. A distinctness of image instrument for measuring the reflective quality of a surface comprising:

a light source and a light detector defining an optical path therebetween, the detector providing an electrical output signal responsive to detected light,

means for positioning the instrument relative to the surface to be measured such that light from the source is reflected by the surface to the detector,

an aperture means in the optical path near one of the sources and the detector,

a motor driven chopper having a plurality of blades near the other of the source and the detector, the chopper being driven at a constant speed for periodically interrupting the light path,

lens means in the optical path for substantially focussing the image of one of the aperture means and a chopper blade on the other for a planar surface, the image being subject to defocussing when the surface is non-planar,

the chopper blades being positioned at various spacings from the source to interrupt the light path at different axial positions along the path for varying the optical path length between the aperture means and the chopper blades for substantially focussing the image for at least one blade when the surface is non-planar, and

an electrical circuit for determining the rate of change of the detector signal for each light interruption and selecting the maximum rate of change as a measure of the reflective quality of the surface.

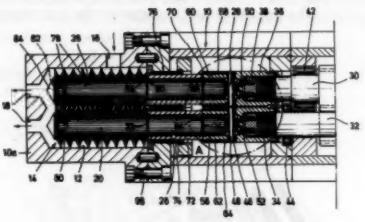
4,527,899

PROCESSING SHAFT FOR MACHINES FOR EXTRUDING, KNEADING, DISPERSING, MIXING OR HOMOGENIZING, IN PARTICULAR, PLASTICS MATERIALS

Josef A. Blach, Wilhelmstrasse 24, 7144 Asperg, and Kurt Stade, 8754 Grossostheim, both of Fed. Rep. of Germany

Filed Jun. 12, 1984, Ser. No. 619,768
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321383
Int. Cl.³ B29F *3/01, 3/02;* **B29B** *1/10*
U.S. Cl. 366—79 **7 Claims**

1. Processing shaft for machines for extruding, kneading, dispersing, mixing or homogenizing viscous, plastic, granular or pulverized materials, comprising a core shaft having at least one longitudinal groove and annular disc-shaped or bushing-type slip-on processing members which are provided with a projection for engagement with the core shaft longitudinal groove to prevent rotation on the core shaft, also comprising an axial securing member for the processing members which is attached to the front end of the core shaft, at least one slip-on spacer sleeve on the core shaft to support the processing members axially rearwardly, with a sealing surface on its external circumference, a slip-on coupling sleeve at the rear end area of the core shaft with a projection for engagement with the core shaft longitudinal groove for torque transmission and with an external thread onto which a clamp nut with an internal thread



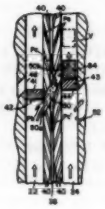
is screwed so as to overlap the coupling sleeve, and a clamping force transmitting member tightenable rearwardly against a stop member of the core shaft by the clamp nut, characterized in that the transmitting member is in the form of a bolt (**48**) which extends transversely to the core shaft axis and is inserted into a channel (**28**) of the core shaft (**20**) forming the stop member and likewise extending transversely to the core shaft axis, and in that the coupling sleeve (**36**) is supported in a forward direction via the spacer sleeve (**72**) and the processing members (**78**) on the securing member (**84**).

4,527,900

ROTARY PROCESSORS AND SEALS

Pradip S. Mehta, and Lefteris N. Valsamis, both of West Haven, Conn., assignors to USM Corporation, Farmington, Conn.

Filed Sep. 14, 1983, Ser. No. 532,157
Int. Cl.³ B01F *7/10*
U.S. Cl. 366—99 **6 Claims**



1. A rotary processor for processing viscous materials and comprising:

(a) a rotatable element comprising a rotor carrying at least first and second annular processing channels extending radially inwardly from the surface of the rotatable element;

(b) a stationary element providing a coaxial closure surface spaced apart from the rotor surface by a clearance and cooperatively arranged with the channels to form at least first and second enclosed annular processing passages, the stationary element also having associated with it an inlet for introducing material to the first processing passage, a blocking member providing an end wall for each passage to collect material processed in the passage for discharge from the passage, an outlet positioned near the end wall of the second processing passage for discharging material from the second processing passage and a material transfer

groove interconnecting the first and second processing passage in an in-series relationship and extending from a point near the end wall of the first processing passage to the second processing passage for discharging material from the first processing passage and transferring the discharged material to the second processing passage, and wherein a pressure differential is established between the first and second passages during operation; and

(c) sealing means to control leakage of pressure and material between the first and second processing passages comprising:

(1) an annular sealing groove carried by the portion of the rotor surface between the first and second processing passages, extending over the entire circumference of the rotor surface portion and arranged to pass under the material transfer groove as the rotor rotates;

(2) means to maintain the material transfer groove substantially completely full of viscous material and to maintain the material in the material transfer groove under sufficient pressure to fill the portions of the sealing groove passing under the material transfer groove with pressurized viscous material from the material transfer groove; and

(3) means to maintain the sealing groove substantially completely full of pressurized viscous material and to urge the material radially outward to contact the closure surface over the full circumference of the sealing groove, and comprising a plurality of helical grooves carried by the portion of the rotor surface between the first and second processing passages on both sides of the sealing groove, a distributed about the entire circumference of the rotor surface portion, and extending from the sealing groove toward the processing passages at acute angles with respect to the direction of rotation, the helical grooves being open at their inward portions to the sealing groove, and being arranged to pass under the transfer groove as the rotor rotates and to direct material toward the sealing groove, so that a live O-ring seal is maintained about the full circumference of the rotor surface, so that leakage of pressure and material between the first and second processing passages is controlled.

4,527,901

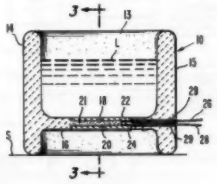
ULTRASONIC CLEANING TANK

Edward G. Cook, New Milford, Conn., assignor to Ultrasonic Power Corporation, Freeport, Ill.

Filed Nov. 21, 1983, Ser. No. 553,723

Int. Cl.³ B01F *11/02*

U.S. Cl. 366—127 **14 Claims**



1. An ultrasonic cleaning tank comprising:

(a) a receptacle adapted to confine a liquid in which cavitation may be induced by application of selected frequencies thereto; and

(b) at least one piezoelectric element secured to said receptacle and including

(1) a ceramic portion, the ceramic material of which is initially fired to impart thereto requisite characteristics of strength and form and which is thereafter polarized to impart a piezoelectric characteristic thereto, and

(2) a pair of electrodes for resonating said ceramic portion, said receptacle and electrodes comprising separate members at least one of which must be united with the ceramic portion during the initial firing thereof.

4,527,902

METHODS AND MIXERS FOR THE CONTINUOU[S] ADDITION OF GLUE TO MIXTURES CONSISTING [OF] WOOD CHIPS, WOOD FIBRES OR THE LIKE

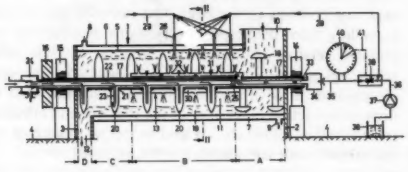
Werner Christen, Mannheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 575,812

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304129

Int. Cl.³ B01F *5/04*

U.S. Cl. 366—169 **14 Claims**



1. A method for the continuous addition of glue to a mixture consisting of wood chips, wood fibres or the like, in which the mixture is moved helically, in the form of a ring of mixture, through at least one glue-applying zone in which glue is supplied substantially radially to the mixture from the inside of the ring of mixture, wherein the glue is very finely atomized in the space situated inside the ring of mixture and is supplied largely radially to the ring of mixture.

4,527,903

APPARATUS FOR UNIFORMIZING THE PARAMETERS OF A FLOW AND/OR FOR MIXING TOGETHER AT LEAST TWO INDIVIDUAL STREAMS WHICH DISCHARGE INTO A MAIN FLOW

Hans Ruscheweyh, Aachen, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengsellschaft, Ratingen, Fed. Rep. of Germany

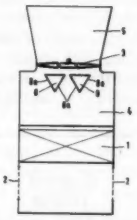
Continuation of Ser. No. 132,477, Mar. 19, 1980, abandoned. This application Jul. 21, 1982, Ser. No. 400,211

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911873

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.³ B01F *5/06*

U.S. Cl. 366—337 **15 Claims**



1. In a gas flow system having at least one gas flow means capable of conducting streams of gas flow therethrough and defining a main direction of flow of at least one of the streams, the improvement comprising

means for mixing said streams of the gas flow in the gas flow means,

said mixing means comprises at least one element arranged in said at least one of said streams,

said element is a substantially, delta-shaped flat plate having planar surfaces and a sharp and free upstream V-shaped edge defining an upstream vertex and two portions of said edge on respective sides of said vertex, each of said two portions defining a sharp edge in cross-section,

said surfaces of said plate being oriented inclined at an acute angle relative to said main direction of flow of said one stream,

said two portions of said edge extending transversely inclined to said main direction of flow of said one stream, wherein

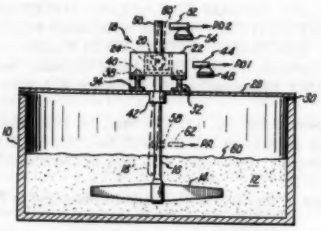
said two portions of said edge therefrom within a flow cross section of said one stream initiating two continuous conically widening oppositely rotating vortexes from each of said two portions of the edge, respectively, the vortexes travelling from the respective portions downstream and inclined relative to said main direction of flow while widening conically including transversely to the main direction of flow of said one stream, extending into the flow cross section of another of the streams, and effecting, substantially exclusively via said vortexes, mixing of said one stream with said another of the streams.

4,527,904

MEASUREMENT OF FLUID FORCES IN MIXING APPARATUS AND THE CONTROL OF MIXING APPARATUS IN RESPONSE TO FLUID FORCES

Ronald J. Weetman, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 12, 1984, Ser. No. 619,971
Int. Cl.³ B01F *15/04*
U.S. Cl. 366—348 **34 Claims**



14. The method of measuring fluid forces on an impeller shaft of a mixing apparatus which shaft is driven by a drive mechanism mounted on support members which comprises the steps of measuring the movement of said mechanism when the impeller shaft is rotating with respect to the position of the drive mechanism when the impeller shaft is not rotating, and detecting said fluid forces from said measurement.

4,527,905

TIMER

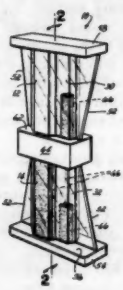
John B. Kohls, Cincinnati, Ohio, assignor to Berkoh Company, Inc., Cincinnati, Ohio

Filed Nov. 19, 1984, Ser. No. 673,170
Int. Cl.³ G04F *1/04*
U.S. Cl. 368—93 **15 Claims**

1. A timer comprising

at least two upper chambers and two lower chambers for containing a particulate material,

conduit means connecting said upper chambers with said lower chambers to direct the particulate material first to



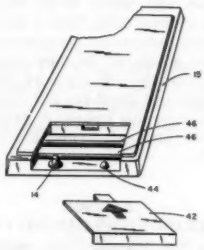
fill one of said lower chambers and then to direct the particulate material to a second lower chamber.

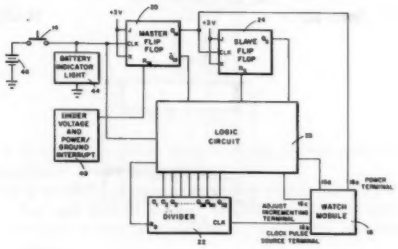
4,527,906

DIGITAL MENSTRUAL CYCLE INDICATOR

Venda Jezbera, 642 Encino Vista Dr., Thousand Oaks, Calif. 91362

Filed Dec. 27, 1982, Ser. No. 453,711
Int. Cl.³ G04F *8/00*
U.S. Cl. 368—107 **1 Claim**





1. A menstrual cycle indicator, comprising:

a watch module having a multidigit display and a clock pulse source, and continuously operable in a certain adjust mode in which pulses supplied to the module will increment the display,

a reset switch;

control means, operable in response to actuation of said reset switch, for clearing the display, for switching said module to said certain adjust mode, and, while said module is operating continuously in said adjust mode, for supplying

divided pulses from said clock pulse source to said module to increment the display by "one" for each day period, thereby facilitating indication of the day of the menstrual cycle,

timekeeping inhibit means, cooperating with said control means, for continually preventing said watch module from operating in the normal timekeeping mode,

a power source, said display being operable at a lower voltage than said divider, and a failsafe circuit comprising:

means for detecting the decrease of the power source voltage below the voltage level required to operate the divider;

means for clearing the display of the watch module and resetting the divider in response to such detection, whereby the display of erroneous data is prevented, together with;

a housing for the digital menstrual cycle indicator wherein the housing has a cavity;

a cover for the cavity;

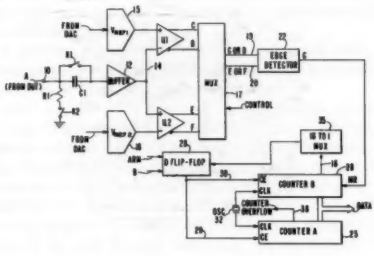
said reset switch being situated in the cavity concealed by the cover, thereby preventing accidental actuation of the reset switch.

4,527,907

METHOD AND APPARATUS FOR MEASURING THE SETTLING TIME OF AN ANALOG SIGNAL

Kai Y. Chan, Milpitas, Calif., assignor to Fairchild Camera and Instrument Corporation, San Jose, Calif.

Filed Sep. 6, 1983, Ser. No. 529,301
Int. Cl.³ G04F *8/00*
U.S. Cl. 368—118 **15 Claims**



1. Apparatus for measuring the settling time, relative to a reference time, of an analog signal having varying amplitude comprising:

oscillator means for generating periodic signals;

comparator means for comparing the amplitude of the analog signal with first and second reference signals, the comparator means supplying a reset signal when the amplitude of the analog signal is not between the first and second reference signals;

first and second counting means connected to the oscillator means for counting the periodic signals from the oscillator means, both counting means being enabled at the reference time to begin counting, and the second counting means being connected to receive the reset signal from the comparator means to reset counting by the second counting means whenever the reset signal is received; and

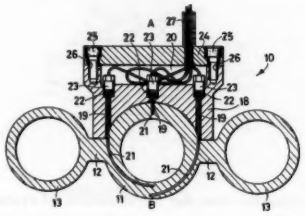
means for detecting the difference in count between the first counting means and the second counting means.

4,527,908

INSTRUMENT UNIT FOR MEASURING TEMPERATURES AND HEAT FLUX IN EVAPORATIVE WALLS OF STEAM GENERATORS

Sergio Arisi, Milan, Italy, assignor to Cise - Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

Filed Jan. 26, 1984, Ser. No. 574,249
Claims priority, application Italy, Jul. 7, 1983, 21965 A/83
Int. Cl.³ G01K *1/08*
U.S. Cl. 374—147 **1 Claim**



1. An instrumented unit for measuring the temperatures and heat flux in evaporative walls of steam generators composed of a series of parallel tubes, characterised by comprising a temperature measurement device composed of a plurality of sensors extending in a fluid-tight manner from a support member and inserted non-forcibly into complementary curved seats of constant radius provided in a cross-sectional wall portion of one of said tubes, said support member being fixed in straddling relationship to said one tube and comprising, for said sensors, seats which are fluid-tight against said one tube.

4,527,909

SEALED TEMPERATURE PROBE

Steven M. Dale, Williamsville; Richard C. Paluch, Blasdell, and Gerald A. Setter, Jr., Depew, all of N.Y., assignors to Conax Corporation, Buffalo, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,166
Int. Cl.³ G01K *7/00, 1/08*
U.S. Cl. 374—163 **6 Claims**

1. A temperature probe, comprising:

temperature sensing means including a sensor having sensor wires, a metal casing and a body of mineral insulation surrounding said sensor wires and compressed thereagainst by said casing, said sensor wires extending outwardly beyond an end of said body;

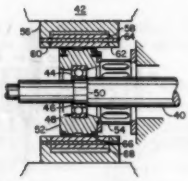
means for sealing said end of said body of mineral insulation including a metal tubular housing, means for sealingly connecting said housing at one end to said casing, at least one body of sealant material transversely filling said housing at its other end and having an inner end spaced from said end of said mineral insulation body, and lead wires extending through said body of sealant material and therebeyond at both ends, said lead wires being in spaced relation to one another and to said housing, said body of sealant material being compressively sealed within said housing so as to compressively engage said lead wires;

and means within said space electrically joining said lead wires to said sensor wires.

4,527,910
DUAL CLEARANCE SQUEEZE FILM DAMPER

David P. Fleming, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 5, 1984, Ser. No. 596,960
Int. Cl.[3] F16C *27/00*
U.S. Cl. 384—99 16 Claims



1. Apparatus for damping radial motion of external excitation on a shaft rotating about its longitudinal axis in a stationary housing comprising

a non-rotating journal encircling said rotating shaft,

bearing means within said journal extending around said shaft, said bearing means including

a rotatable inner portion mounted on said shaft rotation therewith, and

a non-rotatable outer portion rigidly secured to said journal and extending around said inner portion and spaced therefrom,

a first annular ring member encircling said journal and spaced therefrom a first predetermined distance to provide a low clearance damper for operation under normal conditions,

a second annular ring member encircling said first ring member and spaced therefrom a second predetermined distance greater than said first predetermined distance, said second annular ring member being rigidly mounted relative to said housing, and

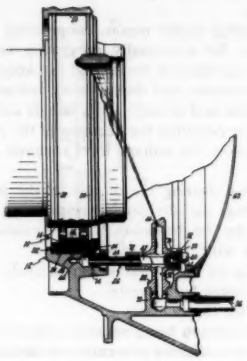
means for selectively securing said first annular ring member to said second annular ring member during said normal conditions, said means being operable to release said first annular ring member under a predetermined force so that said second predetermined distance provides a high clearance damper under abnormal conditions.

4,527,911
LUBRICATION SYSTEM

Joseph Davis, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1983, Ser. No. 487,776
Int. Cl.[3] F16C *39/04, 37/00*
U.S. Cl. 384—99 3 Claims

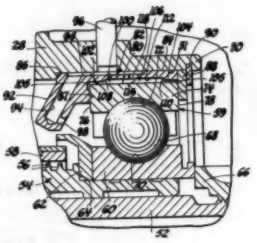
1. A combined fluid feed system for a roller bearing for a gas turbine engine and its fluid damper which bearing supports a rotary shaft, and which bearing is surrounded by said fluid damper, said system comprising means for lubricating and cooling said bearing and continuously supplying fluid to said damper, a single source of fluid for both the lubricating and cooling of said bearing and the fluid for said damper, said means including a transfer tube having an elongated cylindrical body, a housing for encapsulating said bearing, a support member adjacent said housing supporting said cylindrical body in a bore formed in said support member, conduit means interconnecting said source of fluid for leading lubrication to said bearing through a slot formed in said transfer tube directly to an orifice through a first passageway in said support member for directing said lubricant directly at said bearing and for leading fluid to said fluid damper through said slot and an axial passageway formed in said elongated cylindrical body transverse to said first passageway and drilled holes formed in said housing.



4,527,912
SQUEEZE FILM DAMPER

Steven A. Klusman, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1984, Ser. No. 615,831
Int. Cl.[3] F16C *27/04*
U.S. Cl. 384—99 6 Claims

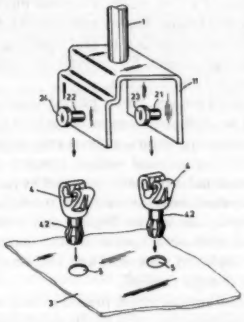


1. A squeeze film damper for damping vibration of a rotor disposed on a support for rotation about a nominal axis of said support comprising, means on said rotor defining a non-rotatable outer plain cylindrical surface vibrateable as a unit with said rotor, means on said support defining an inner plain cylindrical surface concentric with said outer surface when said rotor is aligned on said nominal axis and cooperating with said outer surface in defining a small annulus having a predetermined axial length and a radial depth corresponding to the maximum radial vibratory displacement of said rotor, means defining a groove in one of said inner and said outer surfaces including a plain cylindrical base surface having an axial length of between $\frac{1}{3}$ and $\frac{2}{3}$ of said small annulus axial length and cooperating with the other of said inner and said outer surfaces when said rotor is aligned on said nominal axis in defining a large annulus having a radial depth of at least three times said small annulus radial depth, and means for maintaining each of said small and said large annuli filled with fluid under pressure.

4,527,913
GEAR SHIFT LEVER ASSEMBLY

Klaus Seifert, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,765
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210319
Int. Cl.³ F16C *27/02, 43/02*
U.S. Cl. 384—215 **6 Claims**



1. A gear shift lever assembly including a gear shift lever, a pivot shaft affixed to said gear shift lever and having a rotary axis and bearing means for supporting said pivot shaft; the improvement wherein said bearing means comprises at least one clip bearing mounted on a carrier and supporting said pivot shaft for angular displacement about said axis, whereby said gear shift lever is pivoted in a plane; said clip bearing including

(a) a longitudinal axis;

(b) a base part;

(c) a radially expandable pin portion projecting axially from said base part and being of reduced circumference relative to said base part;

(d) a bearing portion for receiving said pivot shaft; said bearing portion projecting axially from a side of said base part remote from said pin portion; and

(e) two face-to-face oriented, approximately C-shaped spring tongues projecting from said bearing portion; said spring tongues together defining a clearance smaller than the diameter of said pivot shaft; said spring tongues being arranged for spreading apart upon forcing said pivot shaft thereon in a direction toward said bearing part, and said spring tongues extending over said pivot shaft when received by said bearing part; said spring tongues being arranged unyielding to forces applied by said pivot shaft when seated in said bearing part.

4,527,914
MOUNTING ASSEMBLY FOR A SHAFT

Stephen J. McLaughlin, 315 N. Warson Rd., St. Louis, Mo. 63124; John D. Harville, 111 W. Carlee, Sardis, Miss. 38666, and Gary S. Blair, 207 Panola Ave., Batesville, Miss. 38606

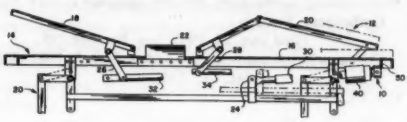
Filed Nov. 1, 1983, Ser. No. 547,672
Int. Cl.³ F16C *35/02*
U.S. Cl. 384—428 **10 Claims**

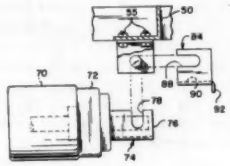
1. A mounting assembly for an elongate shaft, comprising:

(a) a fixed support including opposed, depending support members disposed in spaced relation and having opposed, axially aligned pins attached thereto,

(b) a bearing member receiving the shaft and including opposed sidewalls having opposed open-ended slots receiving the pins, and

(c) a retainer member including opposed sidewalls having opposed open-ended slots receiving the pins, said slots being transversely disposed relative to the slots in the bearing member, said retainer member including means



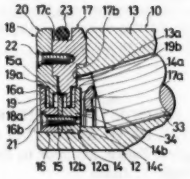


supporting the bearing member against downward movement.

4,527,915
SEALED MULTI-ROW ROLLER BEARING DEVICE FOR ROLLING MILLS

Koichi Ikariishi, Ichichara; Toshiaki Kitano, Higashiosaka; Masanori Shinohara, and Yasuo Shimoji, both of Kashiwara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe and Koyo Seiko Company Limited, Osaka, both of, Japan

Filed May 29, 1984, Ser. No. 615,901
Claims priority, application Japan, May 31, 1983, 58-97637
Int. Cl.³ F16C *33/80*
U.S. Cl. 384—480 **8 Claims**



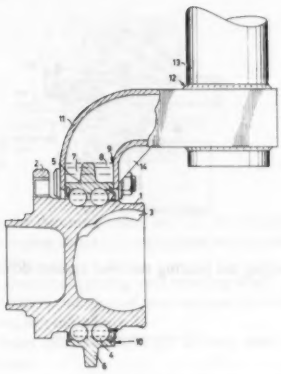
1. A sealed multi-row roller bearing device for rolling mills, characterized in that at the opposite ends of a multi-row roller bearing assembly, the outer ends of the inner races are axially extended beyond the ends of the outer races to form inner race extension annular portions, while non-contact type sealing means is installed at each end of said bearing assembly, said sealing means comprising a plurality of inner annular bodies each having respective outward flanges and axially put together and separably connected by clamp means and then fitted on the inner race extension annular portions so that the annular bodies which are disposed inwardly nearest to the bearing assembly cannot be easily separated form the inner race extension annular portions, and a plurality of outer annular bodies each having respective inward flanges and axially put together concentrically with the inner annular bodies and separably connected by clamp means so that said inward flanges alternate with the outward flanges to define clearances therebetween, said outer annular bodies being then positioned at the ends of the outer races.

4,527,916

MEANS FOR MOUNTING A HUB BEARING UNIT TO A VEHICLE

Sture Asberg, Gothenberg, Sweden, assignor to SKF Nova AB, Gothenberg, Sweden

Filed Oct. 24, 1983, Ser. No. 544,795
Claims priority, application Sweden, Nov. 8, 1982, 8206319
Int. Cl.³ F16C *19/08*
U.S. Cl. 384—513 **3 Claims**



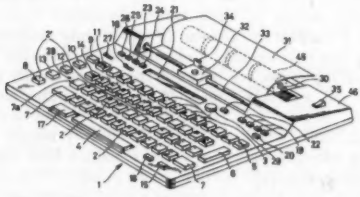
1. In a hub bearing unit for a vehicle or the like, an inner annular member having a flange for attachment to the wheels of the vehicle and an inner raceway, an outer ring having an outer raceway confronting the inner raceway, a radially outwardly projecting circumferentially extending flange on the outer ring and a plurality of rolling elements in the annular space between the raceways and means for mounting the hub bearing unit to the frame structure of the vehicle comprising a stamped sheet metal housing of hollow tubular configuration having an open end which straddles the outer ring having oppositely directed circumferentially extending shank portions and fastener means to secure the housing at said shank portions to said outer ring flange and means for connecting the housing to the spring strut of the vehicle at the end of said housing remote from said shank portions.

4,527,917

ELECTRONIC 3-MODE TYPEWRITER/CALCULATOR WITH SPECIAL DEAD KEYS AND REPEAT KEYS

Hideo Ueno, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 28, 1983, Ser. No. 479,810
Claims priority, application Japan, Apr. 2, 1982, 57-55580; Apr. 2, 1982, 57-55581; Apr. 2, 1982, 57-55582
Int. Cl.³ B41J *5/30*
U.S. Cl. 400—70 **18 Claims**



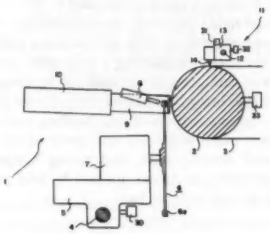
1. An electronic typewriter, which comprises:
a keyboard having a multiplicity of keys including letter keys, numeral keys, arithmetic operator keys, and function keys including an equality key, said keyboard generating code signals corresponding to said keys when said keys are depressed;
a photoelectric display device for indicating characters corresponding to said letter, numeral and arithmetic operator keys;
a printing device for printing said characters along a line of printing;
main control means, connected to said keyboard, and said display and printing devices, for processing said code signals in one of a first mode, a second mode and a third mode, to supply to said display and printing devices sets of pattern data corresponding to said code signals; and
manually operated means for selectively establishing said first, second and third modes,
said main control means, when placed in said first mode, performing an arithmetic operation which is defined in a statement including letters, at least one arithmetic operator and plural numerical values entered through said letter, numeral and arithmetic operator keys, respectively, said main control means in said first mode further directing said display device to display said statement and a result of said arithmetic operation, and making it possible to edit the displayed statement and said result for correction and/or change thereof,
said main control means, when placed in said second mode, making it possible to perform the items of operation in said first mode and directing said printing device to print said statement and said result of arithmetic operation, and
said main control means, when placed in said third mode, directing said printing device to print said characters as the characters are entered.

4,527,918

APPARATUS FOR BOTH PRINTING CHARACTERS AND PLOTTING GRAPHS

Takemi Yamamoto, and Makoto Suzuki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 28, 1983, Ser. No. 489,539
Claims priority, application Japan, May 10, 1982, 57-68593[U]
Int. Cl.³ B41J *3/58*
U.S. Cl. 400—82 **7 Claims**



1. A printing apparatus comprising
a platen for supporting a recording sheet;
a first printing unit having a plurality of type elements and disposed adjacent to the platen so as to be movable along a printing line to print characters or symbols with the type elements on one side of the recording sheet, said first printing unit comprising a printing control unit and a printer;
a second printing unit disposed adjacent to the platen so as to be movable along a printing line for plotting graphs and figures on said one side of said recording sheet, said second printing unit comprising a plotting control unit and a plotting device;
a keyboard having a plurality of character keys, a plurality

of numeric keys, a printing mode selecting key, a plotting mode selecting key, a print key and a plot key;

a first buffer memory for memorizing character code data for controlling the first printing unit;

a second buffer memory for memorizing graphic data for controlling the second printing unit; and

control means having logic for

discriminating between character code data and graphic code data upon operation of said printing mode selecting key and subsequent operation of one or more of said plurality of character keys or numeric keys, or upon operation of said plotting mode selecting key and subsequent operation of one or more of said plurality of numeric keys;

storing said character data in said first buffer memory, and said graphic data in said second buffer memory; and

searching and obtaining said character data from said first buffer memory upon operation of said print key or graphic data from said second buffer memory upon operation of said plot key, and thereafter sending said character code data to said printing control unit of said first printing unit thereby to cause said printer to print corresponding characters or numerals or symbols on said recording paper, and sending said graphic code data to said plotting control unit of said second printing unit whereat responsive to said graphic code data said plotting control unit calculates movement of said recording paper and movement of said plotting device and causes said plotting device to plot the calculated movement of said recording paper; and

wherein said printer and said plotting device are operated singly or concurrently with each other.

4,527,919

METHOD FOR THE COMPOSITION OF TEXTS IN ARABIC LETTERS AND COMPOSITION DEVICE

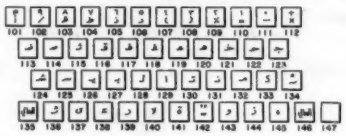
Joseph Aoun, Beirut, Lebanon, assignor to Lettera Arabica S.a.r.l., Beirut, Lebanon

Continuation of Ser. No. 490,205, May 2, 1983, abandoned, which is a continuation of Ser. No. 389,896, Jun. 18, 1982, abandoned, which is a continuation of Ser. No. 199,300, Oct. 21, 1980, abandoned, which is a continuation of Ser. No. 3,949, Jan. 16, 1979, abandoned. This application Dec. 12, 1983, Ser. No. 560,261

Claims priority, application Lebanon, Feb. 7, 1978, 562; May 15, 1978, 571; Nov. 1, 1978, 832

Int. Cl.³ B41J *5/00*

U.S. Cl. 400—111 **5 Claims**



1. Apparatus for composing tests in Arabic letters, comprising

(a) a keyboard (a) including

(1) a plurality of first letter keys each corresponding with a single basic Arabic letter in its various shapes;

(2) a plurality of second keys selectively operable prior to the operation of at least one of said first letter keys to produce linked signals (L) corresponding with a symbol that can occur in various shapes in accordance with context and unlinked signals (not L) corresponding with a symbol that can occur in only a single shape independent of context, said linked and unlinked signals being used to delineate a portion of the various shapes of the basic letter corresponding with said at least one first letter key; and

(3) a plurality of third keys selectively operable subsequent to the operation of said at least one first letter key to produce letter signals (not N) corresponding with the presence of a letter and other than letter signals (N) corresponding with the absence of a letter, said letter and other than letter signals being used to further delineate said portion of said various shapes; and

(b) processing means connected with said keyboard for producing the desired shape of a particular basic letter in accordance with the selected operation of a sequence of said second, first, and third keys, said processing means including

(1) memory means (d) for storing a plurality of output codes corresponding with all of the various shapes of each of said basic letters;

(2) working register means (e) for retaining the signals from said plurality of second and third keys; and

(3) microprocessor control circuit means (b) connected with said memory means and said working register means for processing said retained signals from said second and third keys to determine the output code from said memory means corresponding with the desired shape of said particular basic letter in accordance with the following table:

Second Key	Third Key	Selected Shape of Letter
NOT L	NOT N	1
L	NOT N	2
L	N	3
NOT L	N	4

wherein 1 corresponds with the shape of said particular basic letter at the beginning of a word, 2 corresponds with the shape of said basic letter in the middle of a word, 3 corresponds with the shape of said basic letter at the end of a word, and 4 corresponds with the shape of said basic letter independently.

4,527,920

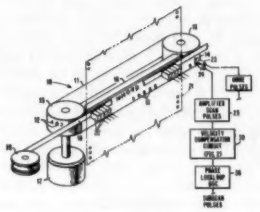
PRINT HAMMER FIRING COMPENSATION CIRCUIT FOR PRINTER VELOCITY VARIATION

John Mako, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,915

Int. Cl.³ B41J *1/20*

U.S. Cl. 400—146 **10 Claims**



1. In a printing device having a moving carrier present type characters at different print positions along a print line of a recording medium and having means for generating a succession of timing signals synchronized with the displacement of said carrier, apparatus for providing an output signal compensating for variations in the velocity of said carrier comprising:

means for generating first clock pulses at a first frequency and second clock pulses at a second frequency;

means responsive to a said timing signal for accumulating said first clock pulses as a representation of the duration of the period of said timing signal;

said accumulating means including first counter means for accumulating said first clock pulses to a predetermined

quantity and second counter means for accumulating said first clock pulses for the duration of said timing signal period;

decrementing means operable in response to the next succeeding timing signal for applying said second clock pulses to said second counter means to reduce the accumulated value thereof to a predetermined value; and

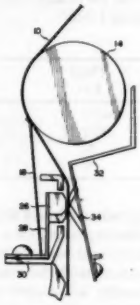
means responsive to said predetermined value for issuing a said output signal.

4,527,921

PAPER FEED APPARATUS FOR SHUTTLE PRINTER

Michio Koizumi; Yasuo Iwata, and Seiichi Ohsawa, all of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 653,682
Claims priority, application Japan, Sep. 30, 1983, 58-183852
Int. Cl.³ B41J *15/16*
U.S. Cl. 400—618 **2 Claims**



1. A paper feeding apparatus for use in a shuttle printer, comprising paper feeding drive means for feeding a print sheet and a paper holding spring for holding the print sheet on a platen to apply a back-tension to the print sheet as it is being moved, said apparatus being characterized by friction means disposed opposed to the print sheet at a position forwardly of said platen in the direction of feed, pressure spring means located opposed to said friction means, and a lever for biasing said pressure spring means against said friction means, said platen being movable between a first position in which the platen is engaged by said paper holding spring and a second position in which the platen is dis-engaged by said paper holding spring, said biasing lever having its tip placed in non-contact with said platen when the platen is engaged by said paper holding spring, said leverengaging said platen to separate said pressure spring means from the print sheet when the platen is moved from said first position to said second position.

4,527,922

FEED ROLLER DEVICE OF TYPEWRITER

Gian P. Barozzi, and Giancarlo Horeschi, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 523,754, Aug. 16, 1983, abandoned, which is a continuation of Ser. No. 287,625, Jul. 28, 1981, abandoned. This application Aug. 3, 1984, Ser. No. 637,526
Claims priority, application Japan, Aug. 11, 1980, 55-110951
Int. Cl.³ B41J *13/048*
U.S. Cl. 400—637.5 **4 Claims**

1. In a typewriter having a platen pivotally supported on a typewriter frame and a feed roller device for pressing a paper to the platen, said feed roller device comprising:

a pair of feed roller assemblies arranged in parallel to an axial direction of said platen, and

a working rod pivotally supported in parallel to the platen on the typewriter frame, having a round surface and a flat surface causing the feed roller assemblies to approach and recede from the platen,

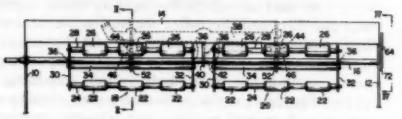
each of the feed roller assemblies including:

a first feed roller row having a plurality of feed rollers arranged on a first rotary shaft,

a second feed roller row having a plurality of feed rollers arranged on a second rotary shaft in parallel to said first rotary shaft,

arms pivotally supporting opposite ends of the first and second rotary shafts, each of said arms having an opening longitudinally extending toward said platen, said working rod extending through said opening and contacting an inner surface of said opening

a connecting rod arranged in parallel to the first and second rotary shafts, ends of said connectings rod being connected to said arms, and



a rocking lever rockingly supported on the typewriter frame, one end of each of which being pivotally supported on said connecting rod at the central portion in the axial direction of each of the feed roller assemblies, the other end of which being connected to a single resilient member for urging each of said said feed roller assemblies toward the platen, said rocking lever being provided for each of the feed roller assemblies and having a surface abutting said flat surface of said working rod,

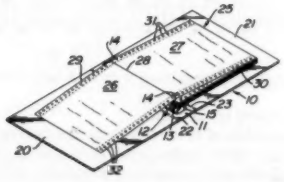
whereby when said working rod is rotated in such direction that said rocking lever is rocked against a resilient force of the resilient member, said arms are displaced such direction that said feed roller assemblies recede from the platen, and when said working rod is rotated in such direction that said working rod is rocked by means of said resilient force, said arms are displaced in such direction that said feed assemblies approach the platen.

4,527,923

LOOSELEAF BINDER FOR COMPUTER PAPER

Morton Waldman, Margate, N.J., assignor to Data Bind Inc., Margate, N.J.

Filed Jul. 15, 1983, Ser. No. 513,649
Int. Cl.³ B42F *13/00, 13/16*
U.S. Cl. 402—75 **4 Claims**



1. In combination, a looseleaf ring binder including at least a pair of spaced aligned openable rings; and a length of continuous computer paper including perforated longitudinal margins, the distance between laterally opposed pairs of perforations of said margins being equal to the distance between said spaced openable rings and said distance being an even multiple of the distance between successive longitudinally spaced perforations along each margin, whereby said computer paper may selectively be fanfolded for binding with said rings passing through the laterally spaced pair of perforations, and optionally sheeted

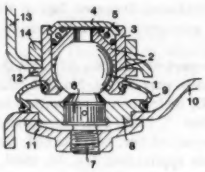
for binding with the rings passing through longitudinally or laterally spaced pairs of perforations.

4,527,924

BALL JOINT FOR SUSPENSION OF WHEELS

Sture Asberg, Västra Frölunda, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Apr. 9, 1984, Ser. No. 597,926
Claims priority, application Sweden, May 18, 1983, 8302780
Int. Cl.³ F16C *11/06*
U.S. Cl. 403—76 **6 Claims**



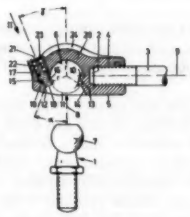
6. A ball joint for suspension of wheels for motor vehicles or the like comprising a ball member supported in a bearing seat in a housing, an attachment bolt member formed integrally with the ball member, means for securing the assembly to a support member having an opening therein of a predetermined diameter and comprising a flange secured to the bolt member which engages in the opening of said support member, said opening and flange member being of a larger diameter than the diameter of said ball member.

4,527,925

ANGLE JOINT

Fritz Bauer; Hans-Peter Bauer, and Hans J. Bauer, all of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer and Sohne oHG, Altdorf b. Nuremberg, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,564
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030433
Int. Cl.³ F16C *11/06*
U.S. Cl. 403—143 **16 Claims**



1. An angle joint consisting of a ball socket and a ball pivot, which is pivotably mounted by means of its ball in the ball socket, the socket having an opening and being shaped like a spherical cap defining a ball seat, the socket including on one side a rigid locating or contacting shoulder which is integral with the ball socket and partially grips the rear of the ball when the latter has been inserted into the socket opening and a locking element, located opposite the locating shoulder, and slidably extending into the socket opening for partially gripping the rear of the ball when the latter is inserted into the socket opening, the locking element being moved out of the socket opening and its locking position when the ball is pushed in the direction of insertion into the socket opening, characterized in that

the locking element is slidably located in a guide recess in the ball socket at an acute angle (γ) of 15°–30° to the direction of insertion and is pressed, in the opposite direction to the direction of insertion, into the locking position by means of a locking spring;

said guide recess having a portion extending transversely to the direction of movement of the locking element and forming a stop shoulder, said locking element being so formed as to have a bearing surface, said locking element bearing surface abutting against said stop shoulder in said guide recess when in said locking position and being free to move against said locking spring when in said locking position;

said locking element including a contact surface which partially grips the rear of said ball, said locking element contact surface comprising a segment of a cylinder having a radius identical to the radius of said socket opening

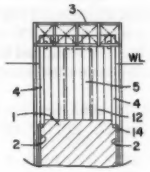
said locking element further having an underside including an unlocking face on said underside directed toward the opening of said socket, said unlocking face bearing against the ball when the ball is inserted into the socket opening in the direction of insertion, whereby the locking element is pushed into the guide recess so that the ball can pass thereby into the socket opening.

4,527,926

METHOD FOR BUILDING A PROTECTIVE WALL WHEN CONSTRUCTING AN UNDERWATER BASE

Seppo J. Hyttinen, Louhimo, 50100 Mikkeli 10, Finland

Continuation-in-part of Ser. No. 179,542, Aug. 19, 1930, abandoned, which is a continuation-in-part of Ser. No. 931,993, Aug. 7, 1978, abandoned, which is a continuation of Ser. No. 803,999, Jun. 6, 1977, abandoned. This application Jul. 28, 1982, Ser. No. 402,549
Int. Cl.³ E02D *19/04*
U.S. Cl. 405—14 **10 Claims**



1. A method of building a protective wall when constructing an underwater concrete base consisting of positioning a formwork having a width dimension at a prepared location, said formwork having a top peripheral edge, positioning an annular continuous protective wall having a width dimension not exceeding the width dimension of said formwork above said formwork with the bottom edge of said protective wall extending substantially through the plane defined by the top peripheral edge of said formwork, said protective wall being formed by in-line vertically extending units joined by vertical joints, and underwater concreting a base slab in said formwork, said base slab intersecting said bottom edge of said protective wall to seal the bottom of said protective wall.

4,527,927

WATER HARVESTING AND STORAGE SYSTEM

Veronique Bucherre, 4707 Connecticut Ave., NW., Washington, D.C. 20008

Filed Apr. 2, 1984, Ser. No. 595,872
Int. Cl.³ B65G *5/00*; **E02B** *13/00*
U.S. Cl. 405—53 **7 Claims**

1. A system for the collection and storage of potable water comprising:

(a) a catchment for the collection of rainwater comprising a water impervious sheet of area selected in dependence on

local annual rainfall, said sheet supported on a prepared ground surface of generally planar form sloping along a single fall line,

(b) said sheet having a portion which is generally rectangular and a contiguous portion which is generally triangular including an apex-like region, said generally triangular portion located horizontally below said rectangular portion with said apex-like region being horizontally below any other region of the generally triangular portion,

(c) a reservoir including a prepared depression adjacent to the catchment and the apex-like region thereof, at least one storage tank located in said depression, each storage tank located in said depression comprising a flexible closed container with at least one inlet and one outlet,

(d) said depression located sufficiently horizontally below said apex-like region so that no portion of any storage tank extends horizontally above said apex region, even if said tank is storing water at maximum volume, all of said storage tanks selected in capacity so that the total storage capacity is related to the number of days of continuous dry weather and the number of consumers,

(e) first piping means coupling said apex-like region of the catchment and an inlet of each storage tank,

(f) at least one pump,

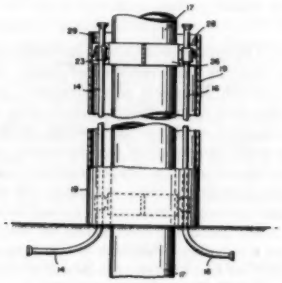
(g) second piping means connecting an outlet of each said tank to said at least one pump.

4,527,928

PROTECTIVE RISER-CONDUCTOR FOR OFFSHORE STRUCTURES

David A. Rutherford, New Orleans, and Gerard P. Albers, Covington, both of La., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,077
Int. Cl.³ E02D *5/60*
U.S. Cl. 405—211 **7 Claims**



1. The combination with a marine structure positioned at an offshore body of water which is exposed to floating ice and which structure comprises a deck having operating equipment carried thereon to receive flows of fluid from a point remote from the marine structure,

at least one elongated support leg means (17) extending substantially uprightly through said body of water and supportably engaging said deck to fixedly dispose the latter a predetermined distance above the water's surface, of;

a non-load bearing protective sleeve (19) removably engaging and being dependent from said elongated support means leg, and surrounding at least a portion of the length thereof which is exposed to contact with ice and other flotsam on the water's surface,

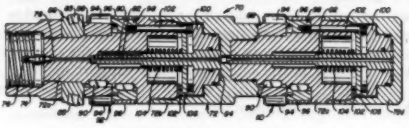
said protective sleeve (17) including an elongated shell (27) which is spaced outwardly from and depends from at least one inner ring (26), the latter being disposed contiguous with the external surface of said elongated leg support means, and being longitudinally adjusted along said leg prior to being fastened to the latter.

4,527,929

ROLLER-GUIDED CUTTING TOOL

Lawrence C. Dickinson, deceased, late of Reno, Nev., and Krestine Corbin, executrix, 532-4 Woodside Oaks, Sacramento, Calif. 95825

Continuation-in-part of Ser. No. 401,580, Jul. 26, 1982, , which is a continuation-in-part of Ser. No. 301,503, Sep. 14, 1981, Pat. No. 4,425,693, which is a continuation-in-part of Ser. No. 205,026, Nov. 7, 1980, Pat. No. 4,380,851, which is a continuation-in-part of Ser. No. 183,664, Sep. 2, 1980, Pat. No. 4,367,576. This application Jan. 11, 1984, Ser. No. 569,946
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Int. Cl.³ B24B *39/00, 39/02*
U.S. Cl. 407—1 **4 Claims**



1. A skiving and roller burnishing tool for mounting on a rotatable drive member to cut and burnish the interior of a cylinder or other workpiece, said tool comprising:

an elongate drive tube assembly having means for attachment to the drive member;

a cutting assembly attached to the drive tube assembly at a forward end thereof;

a first roller assembly having a plurality of radially adjustable rollers, said first roller assembly being located on the drive tube assembly to the rear of the cutting assembly; and

a second roller assembly having a plurality of radially adjustable rollers, said second roller assembly being located on the drive tube assembly to the rear of the first roller assembly;

wherein the first and second roller assemblies each include:

a roller race having a central axis coincident with that of the drive tube assembly and a frustoconical outer surface tapering radially outward in the axially forward direction;

a plurality of frustoconically tapered rollers each having a large end and a small end and being arranged about said outer surface with the small ends of said rollers facing forward so that the surface portion of each roller furthest from the central axis of the roller race is generally parallel to said central axis;

a roller cage having a plurality of slots, said roller cage circumscribing and being spaced apart from the roller race so that said slots and said roller race together define a plurality of cavities for receiving individual rollers;

a roller pusher having (1) a forward extension for directly engaging the rear surfaces of individual rollers when the pusher is moved forwardly relative to the roller race to push the rollers forward and cause the rollers to translate radially outward along the tapered surface of the roller cage, and (2) a lip for directly engaging the roller cage when the pusher is moved rearwardly relative to the roller race to draw the rollers rearward and allow the rollers to translate radially inward;

means for biasing said roller pusher in said forward direction

with a preselected force so that the force exerted upon said internal surfaces of said hole remains constant over a range of sizes of said hole; and

means for retracting the roller pusher when the axial force is reduced to draw the roller cage rearwardly so that the rollers move radially inward and the tool can be withdrawn from the workpiece.

4,527,930

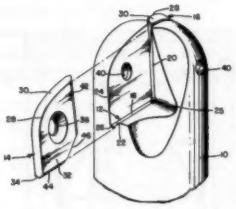
BALL NOSE END CUTTING TOOL

Hugh Harroun, 111 Elm St., Holly, Mich. 48442

Filed Mar. 23, 1983, Ser. No. 477,782

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—42 **1 Claim**



1. A ball nose end cutting tool comprising a tool holder having at least two opposed bit-receiving pockets formed therein that are adapted to hold corresponding cutting bits;

each pocket having an inclined locator edge surface, a planar inner side wall, and an open outside area which permits unrestricted chip flow, each pocket further including a bottom wall which extends in a transverse direction from approximately the center of said tool holder to its periphery, said bottom walls being generally parallel to each other and slightly inclined relative to the longitudinal axis of said tool holder, and each said pocket including an end wall which extends generally in the same direction as the longitudinal axis of said tool holder but being slightly inclined thereto, and said planar side walls merging with said bottom walls, and each said locator edge surface being generally L-shaped and having vertically and horizontally disposed leg portions to match a corresponding pocket bottom wall and pocket end wall, and said locator surfaces being inclined relative to said pocket bottom walls and end walls;

said planar side walls being oppositely inclined relative to the longitudinal axis of said tool holder;

means for securing said cutting bits to said pockets and said cutting bits having curved cutting edges and complementary locator edges which are seated against said inclined locator edge surfaces, and each said cutting bit including vertically and horizontally disposed inclined locator edges which are adapted to seat against the vertical and horizontal leg portions of a corresponding locator edge surface; and

said cutting bits including side walls which are seated against said planar pocket side walls to permit positioning of said cutting bits in a substantially end-to-end relationship such that said cutting edges form a substantially continuous reverse curve from the center of said tool holder with said curve having substantially parallel outwardly extending tangent portions, and said cutting bits bearing against the vertical leg portions of said locator edge surfaces to thereby reduce the cutting stresses being applied to said cutting bits.

4,527,931

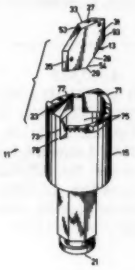
INDEXABLE INSERT FOR MINING DRILL

Vinod K. Sarin, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 27, 1983, Ser. No. 499,003

Int. Cl.³ E21B *10/62;* **B23B** *27/16*

U.S. Cl. 407—113 **1 Claim**



1. A removable and indexable insert adapted for rotation about an axis comprising a pair of side surfaces being substantially parallel and extending in the axial direction, each side surface forming a leading insert surface and a trailing insert surface whereby said leading insert surface is presented forward of said trailing insert surface in the direction of rotation, a pair of faces projecting forwardly along the axial direction, a pair of faces projecting rearwardly along the axial direction, each face forming a cutting edge at the juncture with the leading insert surface of a respective side surface, a pair of end portions, each of said end portions having an axially aligned and concave end surface intermediate respective side surfaces forming side cutting edges at the juncture with respective side surfaces, each side surface including a pair of indents, each indent being positioned adjacent an end portion in a respective leading insert surface.

4,527,932

SELF-TAPPING SCREW

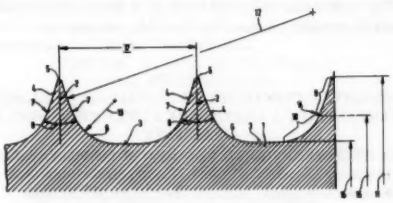
Jürgen Onasch, and Gottfried Ehrenstein, both of Kassel, Fed. Rep. of Germany, assignors to Richard Bergner GmbH & Co., Schwabach, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,713

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207975

Int. Cl.³ F16B *35/00*

U.S. Cl. 411—411 **11 Claims**



1. In a self-tapping screw having major and minor diameters and including a thread core and a cutting thread around the core, said cutting thread having a symmetrical thread profile with a crest and flanks extending inwardly from the crest through rounded transitions to thread roots on either side of the crest, the improvement wherein:

the thread angle between the flanks changes steadily from an angle ranging from about 20° to about 30° at the crest to an

angle of about 180° at the thread roots, with the change in the thread angle being less in a radially outer region that is adjacent the crest than in a radially inner region that is spaced apart from the crest;

each flank is shaped as a first circular arc having a first radius and a second circular arc having a second radius that is different from the first radius, the first and second arcs gradually merging into one another, and

the minor diameter ranges from about 0.5 to about 0.7 times the major diameter.

4,527,933

SPIKE PLATE AND METHOD AND DEVICE FOR MANUFACTURING IT

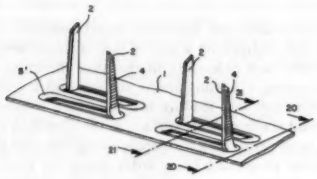
Markku Karhumaki, Erkylantie SF-11130, Riihimaki 13, and Rauno Jarvinen, SF-12540, Launonen, both of Finland

Continuation-in-part of Ser. No. 325,432, Nov. 20, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 582,413

Claims priority, application Finland, Mar. 21, 1980, 800877

Int. Cl.[3] **F16B** *15/00*

U.S. Cl. 411—463 **14 Claims**



1. A prong plate for use as a fastening element in fastening together structural members made of wood, said prong plate comprising a substantially flat base portion and a plurality of elongated strips having a convex cross-section slightly elevated from said base portion, each of said strips having a slot and at least one prong projecting from the convex side of said strip and extending substantially perpendicular to said base portion, one side of the prongs being concave and the other side convex and each prong being united by a foot portion to the plate at the edge of a slot, said prongs being adapted to penetrate into said wooden members so as to fasten them together by pressing the prong plate against a joint therebetween, said strips forming discontinuous elevated sections both transversely and longitudinally relative to the length of said plate, said prongs including toothing extending transversely to the length direction of the prong on the convex side thereof outside of said foot portion and being free of such toothing on the concave side thereof, and the foot portion of said prongs being within said elongated strips such that said prongs do not extend into said substantially flat base portion.

4,527,934

REMOTELY-CONTROLLED MANIPULATOR CARRIER SYSTEM FOR A LARGE-AREA CELL OF A NUCLEAR FACILITY

Klaus Blaseck, Burgdorf, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,351

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224703

Int. Cl.[3] **B65G** *61/00*; **B25J** *5/04*

U.S. Cl. 414—4 **3 Claims**

1. A manipulator-carrier system for performing remotely-controlled manual-like operations on process equipment in a large-area hot cell such as a facility for reprocessing irradiated nuclear fuel materials, the hot cell being an enclosure with the process equipment disposed along two longitudinally extending walls thereof to define a passageway in the direction of the longitudinal axis of the enclosure, the system comprising:

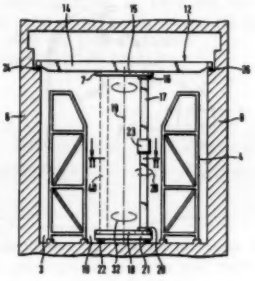
an overhead bridge crane assembly including: a bridge beam extending transversely to said longitudinal axis; and track means for guiding said bridge beam in a horizontal plane above the process equipment in the direction of said axis;

a movable base assembly including: a base platform; and platform guide means for guiding said base platform along said passageway in the direction of the longitudinal axis of the enclosure;

a manipulator assembly mounted between said bridge beam and said base platform, the manipulator assembly including:

an upper plate rotatably mounted on said bridge beam so as to define a vertical rotational axis perpendicular to said horizontal plane;

a lower plate disposed beneath said upper plate and rotatably



mounted on said base platform so as to be rotatable about said vertical rotational axis;

a guide column mounted between said plates and extending in the vertical direction; and

manipulator means including: a support movably mounted on said guide column so as to be movable thereon in the vertical direction; an extendible arm mounted on the support and having a manipulator mounted at the outer end of said arm for engaging and performing manual-like operations on the process equipment; and

said guide column being mounted between said plates so as to be eccentric with respect to said vertical rotational axis whereby said column is movable, with the rotation of said plates, to the left or right side of the passageway, as desired, and into close proximity to the process equipment thereby reducing the distance to which said extendible arm has to be extended to permit said manipulator to perform manual-like operations on the process equipment.

4,527,935

ROUND HAY TRANSPORTER

Durrel W. Fortenberry, Rte. 2, Box 135, Lockney, Tex. 79241

Filed Jul. 14, 1983, Ser. No. 513,693

Int. Cl.[3] **B60P** *1/04*

U.S. Cl. 414—24.5 **8 Claims**

2. The improved machine for handling round hay bales comprising

a. a trailer having

b. two ground engaging wheels connected to

c. an axle,

d. a reach pole extending forward from and normal to the towing axle,

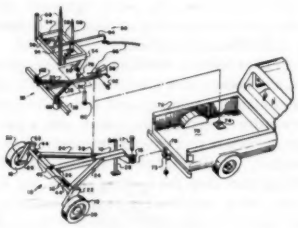
e. a hitch on the front of the reach pole;

f. said trailer being connectable at the hitch to a towing vehicle;

g. a subframe having

h. a cross bar parallel to and resting on the axle,

i. a winch bar extending forward from the cross bar along the reach pole,
j. an electrically powered winch on the forward end of the winch bar, and
k. the winch being connectable by wires to a 12-volt power source on the towing vehicle;
l. a hay carrier having
m. a base pivoted to the cross bar by at least two base arms for rotation about a base axis substantially parallel to the cross bar,
n. the base forming a base plane parallel to and spaced away from the base axis,
o. bale engaging fingers rigidly attached to the base extending transverse of the base plane and pivotable between a substantially vertical and substantially horizontal position,
p. a lift arm extending from the base;
q. a cable extending from the winch to the lift arm to pivot the hay carrier about the base axis;
r. a trailer fastener for releasably interconnecting the winch bar and the reach pole;
s. a pickup having
t. a cargo bed extending to a pickup rear,
u. an edge of the bed at the pickup rear



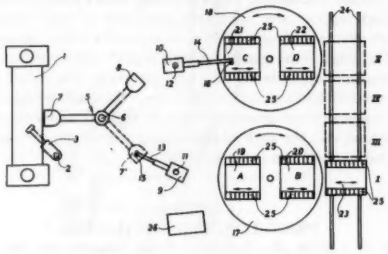
v. said subframe being adapted to rest the cross bar at the bed edge, and rest the winch bar on the bed forward of the bed edge,
w. a pickup fastener for releasably interconnecting the winch bar and the pickup bed;
x. the hay bales each having
y. a bale axis extending through a bale center,
z. a diameter normal to the bale axis, and
aa. a length along the bale axis;
bb. at least two of the bale engaging fingers extending from the base being long fingers that are
cc. spaced apart on the base a distance greater than one half, and less than, the bale diameter,
dd. of sufficient length to penetrate more than half the bale length into the hay bale, and
ee. positioned on the base so that when the hay carrier is pivoted downward about the base axis so that the fingers are substantially horizontal, the long fingers are spaced above the ground, substantially below the bale center and positioned on the base so that when the hay carrier is pivoted upward about the base axis so that the fingers are substantially vertical, the center of gravity of the hay carrier and bale is rearward of the base axis.

4,527,936

AUTOMATIC PLANT FOR STACKING SHEET METAL PRESSINGS

Dieter Hartlieb, Weinsberg, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,760
Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218450
Int. Cl.³ B65H *35/00*; B23Q *7/02*
U.S. Cl. 414—47 **3 Claims**



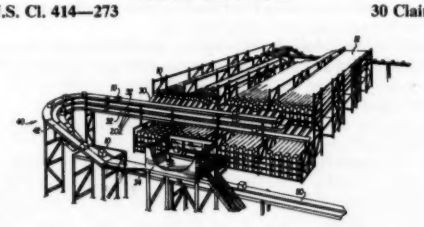
1. An automatic plant for stacking sheet metal pressings from a press, including in combination:
a first turntable with two angularly spaced depositing places which can be moved alternately between a common receiving station and two respective delivery stations by angular movement of the turntable;
a first grab device for moving one pressing after another from said press to the depositing place at the receiving station until a predetermined number of pressings are stacked on said depositing place;
second grab devices, one for each depositing place, arranged to swivel between a pickup point at the delivery station of the respective depositing place and a delivery point;
second turntables, one for each second grab device, having each at least two storage devices each of which can be moved between a first position at which it receives a stack of pressings grabbed by the respective second grab device from the respective depositing place and moved to the delivery point, and a second position by rotation of the turntable; and
a conveying device for alternately picking up a loaded storage device in the second position of the respective second turntable and for replacing the same with an empty storage device.

4,527,937

AUTOMATIC STORAGE AND DISTRIBUTION SYSTEM

Carl A. Tomasello, Jr., Morris Plains, N.J., assignor to Orion Automation Industries, Fairfield, N.J.

Filed May 13, 1983, Ser. No. 494,321
Int. Cl.³ B65G *65/00*
U.S. Cl. 414—273 **30 Claims**



1. A release mechanism for releasing the lead carton in a

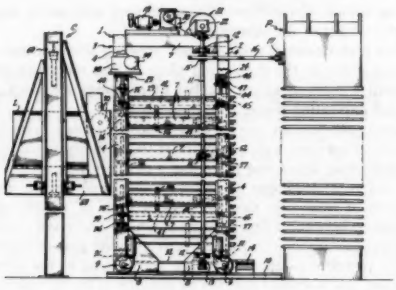
series of cartons which are urged by urging means in one direction along a product lane, the release mechanism comprising: a roller extending above the surface of the lane at an extended position such that the leading edge of the lead carton contacts and is stopped by the roller, the roller being supported on a support arm pivotable about an axis downstream of the roller, the speed at which the urging means transports the carton along the product lane increasing just downstream of the roller, the roller being resiliently urged to the extended position, retracting means for retracting the roller to a position beneath the lane, to allow the cartons to move toward and past the release mechanism, said retracting means being connected to said support arm such that activation of said retraction means pivots said support arm to move the roller against the leading edge of the lead carton and urge the series of cartons in a direction opposite to said one direction, the roller being returned to the extended position when the trailing edge of the lead carton moves over the roller, to thereby allow the roller to extend into the path of the second carton and prevent the second carton from being released.

4,527,938

PRESS-LOADING MECHANISM

John P. Leavitt, Jr., Puyallup, Wash., assignor to American Manufacturing Company, Inc., Tacoma, Wash.

Filed Jun. 19, 1980, Ser. No. 161,169
Int. Cl.³ B65G *65/02*
U.S. Cl. 414—280 **20 Claims**



1. In mechanism for simultaneously loading a plurality of sheet material lay-ups between generally horizontally extending, vertically spaced platens of a press, such mechanism including:

a plurality of shelf means extending generally horizontally toward and away from the press for supporting the plurality of sheet material lay-ups, respectively, in edgewise registration with spaces between the press platens;

means for supporting the shelf means including a rear shelf support member remote from the press and connected to the shelf means and a front shelf support member adjacent to but separate from the press; and

shelf-moving means for moving the rear shelf support member toward and away from the press for moving the shelf means into and out of the press;

the improvement comprising:

a plurality of stop members mounted, respectively, above the shelf means;

first stop-moving means for moving each of said stop members generally vertically relative to the shelf means between a sheet material edge-engageable position adjacent to the upper surface of the respective shelf means and registered with the path of movement of the sheet material lay-up supported thereby into the press and a sheet material edge-disengaged position enabling movement of such shelf means and the sheet material lay-up supported thereby past such stop member into the press; and

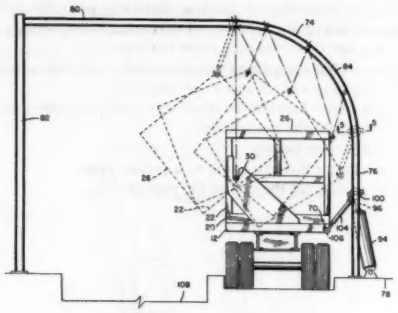
control means for actuating the shelf-moving means and said first stop-moving means.

4,527,939

CONTAINER AND HANDLING APPARATUS THEREFOR

Diego R. Suarez, 6847 Granada Blvd., Coral Gables, Fla. 33146

Filed Feb. 8, 1984, Ser. No. 578,013
Int. Cl.³ B65G *67/24*
U.S. Cl. 414—382 **6 Claims**



1. A vehicle for transporting at least one material-carrying container, said vehicle comprising:

a plurality of wheels, a non-tiltable bed supported on said wheels and upon which the bottom wall of a container can rest, a container having spaced end walls each including an outwardly extending pivot shaft, and a pair of bearing support members that extend upwardly from said bed in substantially parallel relationship and spaced a distance slightly greater than the spacing of the end walls of said container, each said bearing support including a curved bearing surface to rotatably support a pivot shaft of said container and including an elongated, upwardly extending opening to receive and guide one of said pivot shafts toward and away from said curved bearing surface, said opening defined by a pair of spaced walls of unequal length, the longer wall positioned at a greater distance from the longitudinal centerline of said bed than the shorter wall in order to define a transverse stop means to engage one of said pivot shafts to limit transverse movement of said container as it is carried across said bed and when it is loaded onto said bed with the pivot shafts resting on the curved bearing surfaces.

4,527,940

CHEESE UNLOADING MACHINE

Dennis H. Biery, Louisville, Ohio, assignor to Biery Cheese Company, Louisville, Ohio

Filed Aug. 15, 1983, Ser. No. 523,016
Int. Cl.³ B65G *65/23*
U.S. Cl. 414—416 **14 Claims**

13. A machine for removing blocks of cheese from a container having an open top, said machine including:

(a) clamp means for gripping a container having a block of cheese therein;

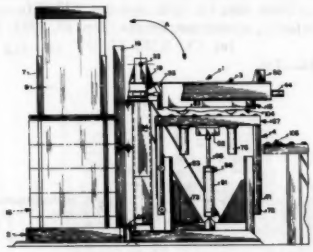
(b) means for inverting the clamp means and a container gripped thereby whereby the open top of the container becomes the bottom of the container;

(c) extractor means including a plurality of suction cups located beneath the inverted open top of the container and engageable with the cheese for removing the cheese through the inverted open top of the container upon

relative vertical movement between the cheese and suction cups;

(d) means located beneath the inverted open top of the container for receiving the cheese;

(e) said cheese receiving means includes a vertically movable conveyor;



(f) said suction cups are mounted on said vertically movable conveyor for movement therewith and relative thereto;

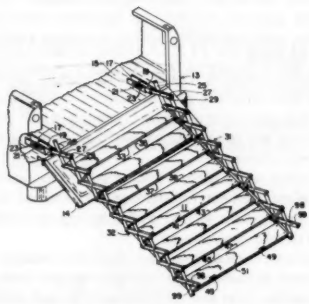
(g) wherein the suction cups engage the cheese and deposit the cheese onto the conveyor.

4,527,941

EXPANDABLE SUPPORT STRUCTURE USABLE AS LOADING RAMP

Danny Archer, Mountain View, Ark., assignor to VRP Partners, Ltd., Columbus, Ga.

Filed Sep. 6, 1983, Ser. No. 529,405
Int. Cl.³ B65G *67/02*
U.S. Cl. 414—537 **17 Claims**



7. An expandable support structure comprising

at least two lazy tongs linkages having a predetermined expansion direction each having at least four links and arranged with corresponding links parallel and spaced apart by the structure width,

a plurality of elongated planks arranged transversely to said linkages, each end of one edge of each said plank being pivotally connected to a respective lazy tongs linkage near an endwise junction of two of said links, the pivotal axes of said planks being transverse to the expansion direction of said linkages, and

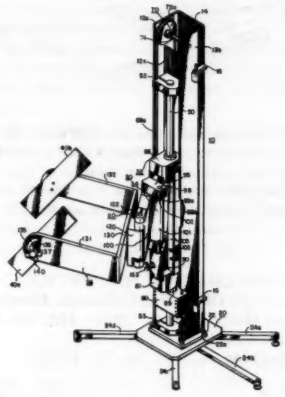
means connected to said planks to cause said planks to be supported when said lazy tongs linkage is expanded with each said plank at an angle of between about 0° and about 45° with said expansion direction, said angle being less than the angle between each link of said lazy tongs linkage and said expansion direction, and to cause said planks to rotate to assume an angle of between about 60° and about 90° with said expansion direction when said linkage is contracted.

4,527,942

ELECTRONIC TEST HEAD POSITIONER FOR TEST SYSTEMS

Nathan R. Smith, Vincentown, N.J., assignor to InTest Corporation, Cherry Hill, N.J.

Filed Aug. 25, 1982, Ser. No. 411,311
Int. Cl.³ B25J *1/12*
U.S. Cl. 414—590 **11 Claims**



1. A system for maintaining a heavy electronic test head floating in a substantially weightless condition without the effect of gravity to permit without external power manual docking and undocking of the test head with an electronic device handler comprising

(a) support means including a continuously vertical shaft forming a first vertical axis,

(b) positioner means pivoted about the continuously vertical shaft and having (1) vertical movement with respect to the vertical shaft and (2) substantial extensible movement in the horizontal plane, the positioner means including pivoting cradle means for attaching the test head,

(c) counterbalancing means coupled to the positioner means to provide a substantially weightless condition to the positioner means with the test head attached, and

(d) the positioner means including at least second and third continuously vertical axes parallel with the first vertical axis so that as the positioner means is extended in the horizontal plane, the vertical shaft and the second and third vertical axes themselves support the weight of the positioner means with the test head attached and the vertical shaft and the second and third vertical axes being simultaneously free to rotate as the positioner means is manually rotated about the vertical shaft and the second and third vertical axes without the effect of gravity.

4,527,943

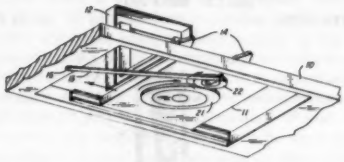
LOAD HANDLING METHOD AND APPARATUS

Edward J. McCormick, Greene, N.Y., assignor to The Raymond Corporation, Greene, N.Y.

Filed May 11, 1983, Ser. No. 493,611
Int. Cl.³ B66F *9/14*
U.S. Cl. 414—666 **12 Claims**

10. In load handling apparatus which includes a main carriage elevatable and lowerable along a mast, a platform mounted on said main carriage for reciprocating movement relative to said main carriage along a first horizontal axis, a load carriage mounted on said platform for rotation about a vertical axis, said load carriage including a load support and means for extending and retracting said load support parallel to a second horizontal axis, motive means for rotating said load

carriage between a first angular position in which said second horizontal axis coincides with said first horizontal axis and a second angular position substantially 90 degrees from said first angular position, a crank connected to be rotated in an amount directly proportional to rotation of said load carriage, and a



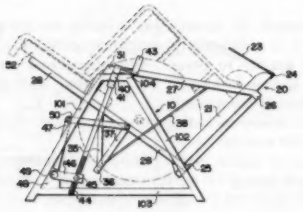
link connected between said crank and said main carriage, the improvement which comprises means interconnecting said crank and said load carriage so that rotation of said load carriage through a given angle causes rotation of said crank through an angle greater than said given angle.

4,527,944

WHEELCHAIR TILTING DEVICE

Marvin C. Qually, 215 Dieppe Rd., Lethbridge, Alberta, Canada T1J 3W8, and Henry P. Vogt, 1824 - 12th Ave. S., Lethbridge, Alberta, Canada T1K 0N6

Filed Mar. 24, 1983, Ser. No. 478,240
Int. Cl.³ A47C *31/00*
U.S. Cl. 414—678 **10 Claims**



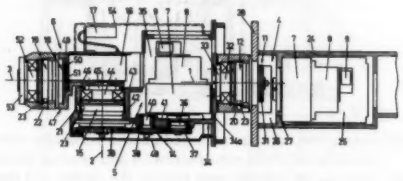
1. Apparatus for tilting a wheelchair and occupant backwardly comprising a first frame having two spaced parallel side frame portions defining a base for mounting on the floor and a transverse pivot axis extending between said side frame portions, a second frame, means mounting the second frame on the first frame inwardly of said side frame portions so as to be pivotally movable thereon about said pivot axis from a first upright position to a second inclined position angularly rotated from the first position and manually operable means for rotating the second frame between the first and second positions, the second frame including a a platform which is substantially horizontal in said first position for receiving the wheels of the wheelchair, a pair of spaced side frame members each arranged inwardly of and adjacent to a respective side frame portion with the platform extending therebetween and an upstanding back support portion rearward of said side frame members for supporting the rear of the chair and the back of the occupant in the second position and a wheel receiving portion extending rearwardly of said back support portion and said platform and inwardly of said side frame members, said mounting means including pivot coupling means for coupling said side frame members to said side frame portions such that the pivot axis is arranged forwardly of the back support portion and passing substantially through the center of gravity of the occupant and chair and the platform is normally raised from the ground whereby a wheelchair can be rolled from the floor onto the platform with the second frame in the first position and the second frame can pivot without vertical movement of the pivot axis.

4,527,945

SWIVELLING HANDLE WITH THREE AXES OF ROTATION FOR AN INDUSTRIAL ROBOT

Jean-Robert Passemard, Bailly Romainvilliers, and Gaston Keledjian, Boulogne Billancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Sep. 14, 1982, Ser. No. 417,851
Claims priority, application France, Sep. 15, 1981, 81 17426
Int. Cl.³ B25J *17/02*
U.S. Cl. 414—735 **5 Claims**



1. A swivelling handle for a robot arm, comprising:
an attachment element adapted to be connected to an end of a robot arm;
a first reduction gear assembly mounted in said attachment element and having an output shaft defining a first axis of movement;
a first motor and a first coding system mounted in said attachment element for driving said first reduction gear assembly, said first motor having an output shaft parallel to said first axis;
an intermediate element rotatably driven about said first axis by said first reduction gear assembly output shaft;
a second reduction gear assembly mounted in said intermediate element and having an output shaft defining a second axis of movement;
a second motor and a second coding system mounted in said intermediate element for driving said second reduction gear assembly, said second motor having an output shaft parallel to said second axis;
an end element rotatably driven about said second axis by said second reduction gear assembly output shaft;
a third reduction gear assembly mounted in said end element and having an output shaft defining a third axis of said movement;
a third motor and a third coding system mounted in said end element for driving said third reduction gear assembly, said third motor having an output shaft parallel to said third axis, wherein said second axis intersects said third motor and said third motor is positioned opposite said second reduction gear assembly with respect to a plane containing said first axis and extending orthogonal to said second axis; and
a tool support rotatably driven about said third axis by said third reduction gear assembly output shaft,
wherein each of said reduction gear assemblies comprises a first reduction stage engaged with a respective motor output shaft and including a gear train with parallel axes, and a second reduction stage mounted along the respective output shaft axis of said reduction gear assembly,
wherein said second axis intersects both said first and third axes, and wherein said first, second and third axes are coplanar when said first and third axes are colinear.

4,527,946

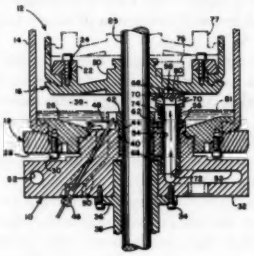
TIRE CURING PRESS WITH POP-UP, ROTATING NOZZLE

Anand P. Singh, Youngstown; Virgil Y. Blosser, Canfield, and Thomas A. Crumbacher, Columbiana, all of Ohio, assignors to NRM Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 424,411, Sep. 29, 1982, abandoned. This application Jan. 23, 1984, Ser. No. 573,007

Int. Cl.³ B29H *5/02*

U.S. Cl. 425—42 **35 Claims**



1. In a tire curing press, a center mechanism operative to define a fluid chamber in which heat transfer fluid media is circulated to shape and cure an uncured tire carcass in the press, nozzle means for introducing such fluid media into said chamber, and means for mounting said nozzle means in said center mechanism for movement between relatively retracted and extended positions in said chamber, said means for mounting including a porting member in said center mechanism, and said nozzle means being mounted in said porting member for extension and retraction.

4,527,947

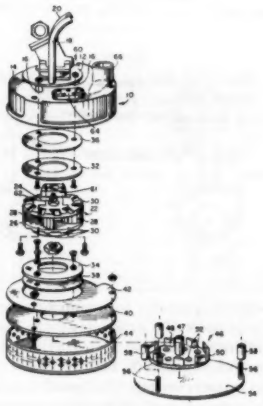
SEAL-FREE IMPELLER PUMP FOR FLUIDS CONTAINING ABRASIVE MATERIALS OR THE LIKE

Eric R. Elliott, 58 Argyle St. N., Renfrew, Ontario, Canada K7V 1S8

Filed Feb. 17, 1984, Ser. No. 581,329

Int. Cl.³ F03B *13/10*; **F04D** *7/06*

U.S. Cl. 415—121 B **6 Claims**



1. An impeller pump comprising:

a unitary pump housing;

an impeller unit adapted for rotation within said housing;

said pump housing having a peripheral wall and a top, and an open bottom, with motor mounting means on the top thereof, adapted to support a motor thereon in axial alignment with said impeller unit, said motor including a drive shaft adapted to project through said motor mount and the top of said housing for connection with said impeller unit;

said impeller comprising a pair of spaced-apart circular expeller faces each having a plurality of outer, unitary, radial, wedge-shaped vanes around the circumferences thereof with a plurality of arc-shaped impeller vanes between said circular faces, said impeller being eccentrically mounted within said housing;

a bottom plate, adapted to be removably engaged on the open bottom of said housing, said bottom plate having an opening therein in axial alignment with the centre of said impeller;

a pair of stationary circular expeller plates closely spaced from said expeller faces of said impeller, within the housing;

the face of said impeller facing the open side of said pump housing having a central opening for fluid ingress; and

said housing having an opening for fluid egress on the top thereof near the peripheral wall thereof.

4,527,948

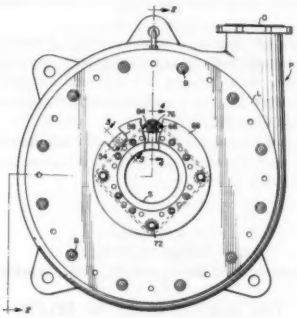
PUMP ADJUSTMENT ASSEMBLY

Graeme R. Addie, Augusta, Ga., assignor to GIW Industries, Inc., Grovetown, Ga.

Filed Nov. 3, 1982, Ser. No. 438,660

Int. Cl.³ F04D *29/08*

U.S. Cl. 415—128 **15 Claims**



1. A centrifugal pump having a housing provided with an axis, an impeller rotatably disposed within said housing for rotation about said axis, said housing having a suction inlet along said axis and a discharge radially outwardly of said inlet, wherein the improvement comprises:

(a) said impeller being provided with first circular surface adjacent to said inlet;

(b) a cylindrical wear ring having, at its inner end, a second circular surface conforming to and abutting said first circular surface;

(c) a hollow tubular wear ring holder receiving, in the inner end portion thereof, the outer end portion of said wear ring for holding said wear ring for movement with said wear ring holder, said wear ring holder being telescopically received within the inlet of said housing for movement axially toward and away from said impeller; and

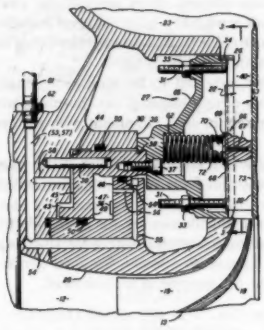
(d) control means connected to said wear ring holder for incrementally moving said wear ring holder toward and away from said impeller.

4,527,949

VARIABLE WIDTH DIFFUSER

Howard W. Kirtland, No. Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,019
Int. Cl.[3] F04D 27/02
U.S. Cl. 415—150 18 Claims



8. In a centrifugal machine having a casing for rotatably supporting an impeller for bringing working fluids to the entrance of a diffuser, said diffuser including

a radially disposed fixed wall and a similarly disposed movable wall adjacent thereto for varying the size of the diffuser passage,

drive means operatively connected to the movable wall to selectively position the movable wall in regard to the fixed wall between a maximum flow position and a minimum flow position,

said movable wall having a series of airfoil shaped vanes slidably contained within complementary openings formed therein, said vanes passing through said movable wall and resting against the fixed wall whereby the vanes span the diffuser passage, and

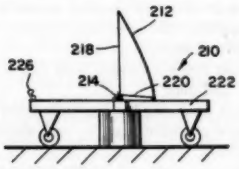
biasing means acting against the back of each vane to urge the vane into seating contact with the fixed wall so that the vane is self-adjusting in assembly.

4,527,950

WIND MOTOR

Lloyd I. Biscomb, 4452 Burlington Pl., NW., Washington, D.C. 20016

Filed Aug. 9, 1983, Ser. No. 521,573
Int. Cl.[3] F03D 3/06
U.S. Cl. 416—117 5 Claims



1. A wind motor for relatively powering a load which has a vertically-oriented rotary input shaft, comprising:

a carrier having at least three radially projecting, generally horizontal arms mounted to a central hub which is constructed and arranged to be operatively mounted to the rotary input shaft of the load;

each arm having a generally horizontal cross-arm mounted thereto radially remote from said hub;

low friction ground support means for each arm mounted to at least one of that arm and its at least one cross-arm;

for each arm, at least one working member in the form of a vane and frame means mounted to the respective at least one cross-arm and providing bearing means journalling the respective vane for rotation between an erect position wherein the vane is disposed to be blown downwind to maximally impart rotary force to the carrier, and a feathered position wherein the vane is disposed to be driven upwind with minimal detraction of rotary force from the carrier

said cross-arm on each arm being disposed with radial spacing from the radially outer end of the respective arm;

the bearing means comprising hinge means mounted on each vane along a lower edge thereof radially inboard and outboard of the respective cross-arm;

the feathered position of each vane being defined by abutment with the respective cross-arm; and

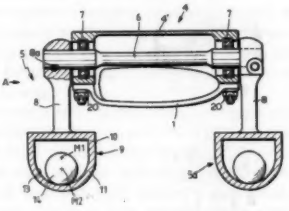
each vane being constituted by a shell having a concave side and a convex side, the concave side being oriented toward the wind when the vane is in its erect position and the convex side being oriented toward the wind when the vane is in its feathered position.

4,527,951

PENDULUM FOR DAMPING OR ELIMINATING LOW EXCITATION FREQUENCIES

Ferdinand Trier, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,392
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226152
Int. Cl.[3] B64C 27/32
U.S. Cl. 416—145 8 Claims

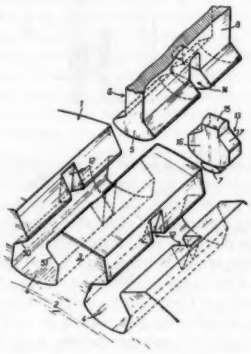


1. A pendulum apparatus for damping or eliminating low excitation frequencies of a helicopter rotor blade, comprising at least one multiple pendulum device (5) including at least two individual pendulum bodies (8, 14), first means (11) operatively coupling said at least two individual pendulum bodies (8, 14) to each other to form said multiple pendulum device, said individual pendulum bodies (8, 14) being tuned to each other so that the respective multiple pendulum device has several eigenfrequencies, and second means for operatively connecting said multiple pendulum device (5) to said helicopter rotor blade for damping or eliminating said low excitation frequencies.

4,527,952
DEVICE FOR LOCKING A TURBINE ROTOR BLADE

Alexandre Forestier, Vaux le Penil, and Raymond J. M. Joubert, Savigny sur Orge, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Jun. 8, 1982, Ser. No. 386,349
Claims priority, application France, Jun. 12, 1981, 81 11565
Int. Cl.³ F01D *5/32*
U.S. Cl. 416—220 R **10 Claims**



1. A device for locking a turbine rotor blade on a rotor disk, said disk including a plurality of teeth defining axial grooves therebetween, said blade including a blade portion, a platform, a shank and further including a root adapted to fit in one axial groove, said blade being radially lockable in said groove by a wedge positionable in a first position between said blade root and a radial bottom of said groove, said device comprising:

a lock unitarily fixed to said shank, said lock having surfaces radially projecting from at least one circumferential side of said shank;

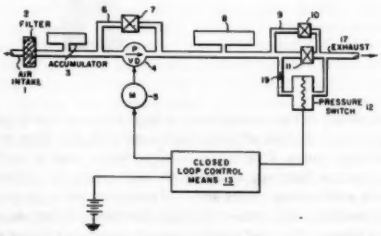
radial bearing surfaces on said teeth;

wherein said lock and bearing surfaces are dimensioned and positioned between the axial ends of the disk teeth such that each said lock interacts with one of said bearing surfaces when said wedge is in said first position, wherein said blade and said lock are constructed so as to be together shiftable in an axial direction for disengaging said locks and said bearing surfaces when said wedge has been removed from said first position.

4,527,953
PUMP UNIT FOR SAMPLING AIR

W. Barry Baker, Newark, Del., and Harry E. Betsill, Timonium, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 12, 1984, Ser. No. 660,053
Int. Cl.³ F04B *49/00, 49/06, 39/16, 11/00*
U.S. Cl. 417—38 **21 Claims**



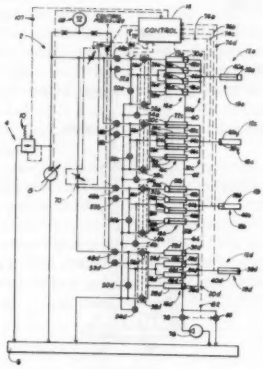
1. An improved pump unit for sampling air and having a constant air flow rate through the unit, the unit having an air intake, a filter means for removing particles or vapors from the air tubularly connected to the air intake, a variable drive air pump connected to the filter means which pump units an air stream through the unit, a variable speed electric motor connected to the pump and drives the pump, a power source for the motor, an orifice positioned in a tubular connection coupled to the pump and causes an air pressure drop in the air stream being pumped through the pump unit, a differential pressure switch with an open and a closed position tubularly placed in parallel relationship to the orifice and is activated by a change in air pressure drop of the air stream caused by a change in air flow through the unit, an exhaust port tubularly connected to the orifice and the differential pressure switch; the improvement used therewith comprises:

digital circuit electrically connected to the pressure switch and a closed loop control means electrically connected to the digital circuit, the power source and the motor; wherein the digital circuit sends a digital low duty cycle pulse signal over a set time interval to determine the predominant open or closed position of the switch during the time interval; in the event the switch is in the predominantly open position, the control means gradually increases voltage from the power source to the motor thereby driving the motor at an increasing speed which in turn drives the pump at an increasing speed and increases air flow through the unit; in the event the switch is in the predominantly closed position, the control means gradually decreases voltage from the power source to the motor thereby driving the motor at a decreasing speed which in turn drives the pump at a decreasing speed and decreases air flow through the unit; whereby the air flow through the unit is maintained at a constant flow rate.

4,527,954
PUMPING APPARATUS

Beegamudre N. Murali; Jeffrey S. Rosenberg, and Clinton W. Cole, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 14, 1983, Ser. No. 457,843
Int. Cl.³ F04B *17/00, 35/02;* **F15B** *9/03, 9/09*
U.S. Cl. 417—46 **18 Claims**



1. A pumping apparatus, comprising:

a first pumping section including first plunger means;

a second pumping section including second plunger means;

a third pumping section including third plunger means;

a fourth pumping section including fourth plunger means; and

control means for operating said four plunger means in a pumping cycle wherein each of said four plunger means functions at different times as a precompression plunger

means, a trailing discharge plunger means, a leading discharge plunger means, and a suction plunger means, said control means including phase control means for controlling the spacing between any of said first, second, third and fourth plunger means functioning as the leading discharge plunger means and any of said first, second, third and fourth plunger means functioning as the trailing discharge plunger means, said phase control means including:

means for subtracting a detected position of the plunger means functioning as the precompression plunger means from a predetermined stroke-length and for dividing the difference by two, thereby defining a phase difference to be maintained between the plunger means functioning as the leading discharge plunger means and the plunger means functioning as the trailing discharge plunger means;

means for adding said phase difference to a detected position of the plunger means functioning as the trailing discharge plunger means, thereby defining a sum;

means for subtracting said sum from a detected position of the plunger means functioning as the leading discharge plunger means, thereby defining a phase error; and

means, responsive to said phase error, for correcting the position of the plunger means functioning as the trailing discharge plunger means.

4,527,955

ELECTROMAGNETIC PUMPS OF THE HELICAL LINEAR INDUCTION TYPE

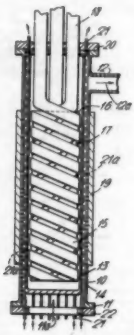
Edward Duncombe, Altrincham, and Gordon Thatcher, Lymm, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 13, 1982, Ser. No. 449,527

Claims priority, application United Kingdom, Jan. 8, 1982, 8200561

Int. Cl.³ H02K *44/02*

U.S. Cl. 417—50 **3 Claims**



1. An electromagnetic pump of the helical linear induction type having a tubular pump housing **(10)**, a cylindrical iron core **(16)**, helical windings **(15)**, an annular flow duct **(14)**, a plurality of sampling pipes **(21)** which traverse the annular flow duct, an inlet **(11)** and an outlet **(12)** for the flow duct, such that electromagnetically pumped flow takes place along paths which lie both inside and outside said sampling pipes **(21)** where they pass through the pump annulus **(14)**.

4,527,956

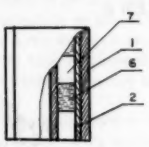
PIPE FOR ELEVATING LIQUID, AND DEVICE PROVIDED THEREWITH

Iosif Baumberg, 54 Bay 29 St., Brooklyn, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,129

Int. Cl.³ F04F *1/06*

U.S. Cl. 417—65 **5 Claims**



1. A pipe for elevating a liquid by displacing liquid portions in an elevation direction with separation of said portions from one another by gas portions, the pipe comprising

means forming a plurality of elongated passages extending in an elevation direction and located adjacent to one another in a direction which is transverse to said elevation direction, each of said passages having a cross section such that a stable meniscus film is formed between each liquid portion and a neighboring gas portion in each of said passages, each of said passages having a plurality of wall portions wettable by the liquid and a plurality of wall portion non-wettable by the liquid, wherein each of said wettable wall portions is located prior to a respective one of said non-wettable wall portions as considered in the elevation direction.

4,527,957

PISTON PUMP

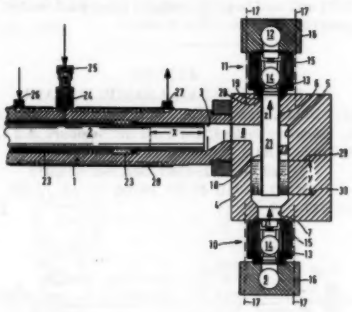
Willi Dettinger, and Hugo Fries, both of Urach, Fed. Rep. of Germany, assignors to URACA Pumpenfabrik GmbH & Co. KG, Urach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 258,755, Apr. 29, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 562,401

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021851; Japan, Jun. 9, 1981, 56-87582

Int. Cl.³ F04F *11/00*

U.S. Cl. 417—92 **30 Claims**



1. A piston pump, particularly a high pressure piston pump for aggressive and/or abrasive and sometimes hot flow media, comprising means forming a suction valve and a pressure valve; means forming a valve through-chamber extending between said suction valve and said pressure valve for passing a flow medium, said valve through chamber having an open end portion, an axis and axially spaced upper and lower ends; means forming a working chamber which is separate from said valve through-chamber and accommodates a displaceable

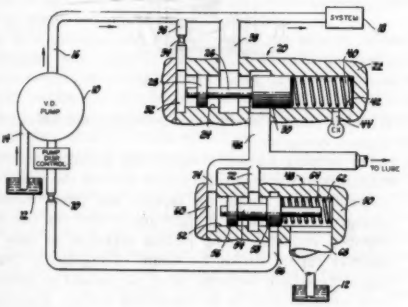
piston; means forming a force-transmitting chamber which partly surrounds said valve through-chamber and communicates with said open end portion and with said working chamber wherein said force transmitting chamber accommodates a force-transmitting medium which transmits energy of displacement of said piston to the flow medium and separates the flow medium from said piston essentially without entering the valve through-chamber so as to perform exclusively force-transmitting functions, said valve through-chamber and said force-transmitting chamber being formed as parts of a common chamber and located substantially concentrically to one another so that the exclusively force-transmitting medium in the force-transmitting chamber displaces concentrically outside of the flow medium in the valve through-chamber without intersection with the latter and wherein the working chamber of the piston being disposed at a vertical distance to the open end portion for preventing the flow medium to penetrate to the piston; a housing block forming said common chamber, said common chamber having a substantially circular cross section, a substantially vertical axis, upper and lower openings coaxial with said axis and leading to said suction valve and said pressure valve, a side opening located near said upper opening and leading to said working chamber; and a pipe coaxial with this axis and extending from said upper opening into said common chamber, said pipe having an open lower end arranged at a distance from said lower opening, said pipe subdividing said common chamber into said valve through chamber located inside said pipe and said force-transmitting chamber outwardly surrounding said pipe.

4,527,958

CONTROL VALVING FOR A VARIABLE CAPACITY PUMP

August H. Borman, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1984, Ser. No. 613,717
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—213 **2 Claims**



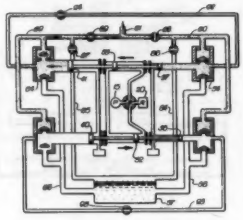
1. An improvement in control valves for a high pressure system and a lube pressure system including a variable capacity pump having a displacement control mechanism which is responsive to fluid pressure in excess oil returned from a regulator valve such that an increase in fluid pressure at the control mechanism is accompanied by a decrease in pump displacement wherein the improvement comprises: a first pressure regulator valve means connected directly with the outlet of said variable capacity pump and being operative to establish a pressure level in said high pressure system and also being operable to bypass excess fluid flow; and a second regulator valve means for establishing a pressure level for said lube pressure system in said excess fluid flow from said first pressure regulator valve means and bypassing the fluid unused by the lube pressure system to the displacement control mechanism of said variable capacity pump to thereby decrease the pump capacity when the high pressure system and lube pressure system have been satisfied.

4,527,959

DRILLING FLUID PUMP PROVIDING A UNIFORM, CONTROLLED PRESSURE AND FLOW RATE

Marvin E. Whiteman, Boise, Id., assignor to Whiteman Manufacturing Company, Boise, Id.

Filed May 10, 1983, Ser. No. 493,351
Int. Cl.³ F04B *9/10*
U.S. Cl. 417—342 **26 Claims**



14. A pump for pumping a working fluid from a supply tank to an outlet conduit, comprising:

a pair of double-ended piston assemblies, each including first and second generally back-to-back cylinders and a reciprocal piston rod having first and second pistons received respectively within said first and second cylinders, said first cylinders and corresponding first pistons being of a first size, and said second cylinders and corresponding second pistons being of a second, different size;

drive means for simultaneously reciprocating said piston rods of said piston assemblies, to reciprocate said pistons within their respective cylinders;

an intake conduit coupled to the supply tank; and

flow control means including intake means for coupling all of said cylinders to said intake conduit upon retraction of their respective pistons, to draw in the working fluid from the supply tank, and discharge means selectively operable for coupling said first cylinders of said piston assemblies upon extension of their respective corresponding pistons, to discharge the drawn-in working fluid to either the outlet conduit or the supply tank, and further selectively operable for coupling said second cylinders of said piston assemblies upon extension of their corresponding pistons, to discharge the drawn-in working fluid to either the outlet conduit or the supply tank, with at least said first cylinders or said second cylinders being coupled to the outlet conduit;

wherein said pair of piston assemblies are sized and configured such that the first pistons in said assemblies cooperate to provide a first uniform pressure and flow rate and such that the second pistons in said assemblies cooperate to provide a second uniform pressure and flow rate, whereby the working fluid discharged to the outlet conduit is substantially free of any cyclic pressure and flow rate variations as said pistons reciprocate in their associated cylinders.

4,527,960

BEARING AIR SEAL FOR VACUUM CLEANER MOTOR

Richard E. DeSisto, Carlisle, Pa., assignor to General Signal Corporation, Stamford, Conn.

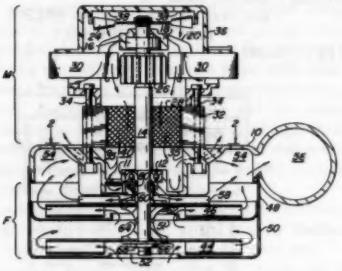
Filed Feb. 3, 1984, Ser. No. 576,667
Int. Cl.³ F04B *39/06*
U.S. Cl. 417—368 **5 Claims**

1. In a motor-fan combination unit having a motor section and a fan section separated by a housing having a motor side and a fan side;

a bearing supporting pocket having at least one air inlet for providing air flow and formed in said motor side of said housing;

a shaft bearing mounted in said bearing supporting pocket,

a diffusing chamber formed in said housing with one wall of said diffusing chamber formed by said shaft bearing, so that said chamber will receive air from said inlet; and



means for flowing motor cooling air from said motor side of said housing into said diffusing chamber and out said fan side of said housing;

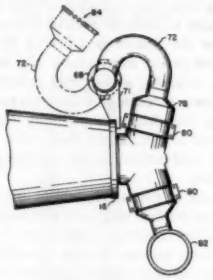
whereby said air flowing through said diffusing chamber sweeps contaminating fluids on said fan side of said bearing out of said chamber to avoid contact of said bearing by said contaminating fluids.

4,527,961

RECIPROCABLE PUMP HAVING AXIALLY PIVOTABLE MANIFOLD TO FACILITATE VALVE INSPECTION

Fletcher H. Redwine, Garland, and James E. Thompson, Richardson, both of Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 411,932, Aug. 26, 1982, Pat. No. 4,467,703.
This application Feb. 27, 1984, Ser. No. 584,209
Int. Cl.³ F04B *39/14, 21/02*
U.S. Cl. 417—454 **2 Claims**



1. In a pump, said pump including at least one reciprocable displacement body, a fluid end piece having a separate passage for receiving each displacement body slidably therein, the passage for each body being joined by suction and discharge passages, valve means in each of the suction and discharge manifold assemblies, each assembly including a manifold, a cover for said valve means, conduit connecting each cover to the manifold, and means for attaching each cover to said fluid end piece, the improvement in said pump which comprises:

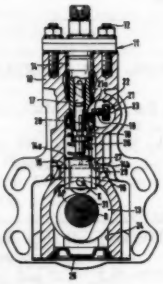
at least one of said manifolds including a body comprising axially separated tubular-shaped portions, an elongated generally tubular-shaped section adapted to fit axially in the space between said body portions, fluid tight joint means joining opposite ends of said tubular section to said body portions, and means mounting said body portions in fixed position with respect to said fluid end, said joint means permitting axial rotation of said tubular section about the axis thereof to a storage position displaced from the fluid end piece for repair and replacement of the valve means.

4,527,962

MULTI-CYLINDER FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Alexander Clemens, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 651,982
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339872
Int. Cl.³ F02M *59/48*
U.S. Cl. 417—499 **3 Claims**



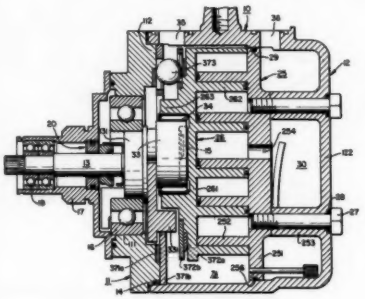
1. A multi-cylinder fuel injection pump for internal combustion engines, comprising

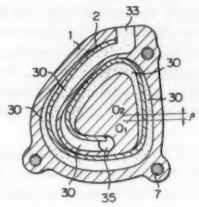
a pump housing having a tunnel-like camshaft chamber extending in the longitudinal axis (AP) of the pump and receiving bores for in-line tappets and pump elements arranged to discharge at right angles into the camshaft chamber, rotatable pump pistons arranged to vary the effective supply stroke, by means of regulating sleeves disposed coaxially with the pump pistons and by means of guide arms secured on the regulating sleeves, a governor rod guided parallel to the longitudinal axis of the pump in a longitudinal recess of the pump housing and arranged to engage the guide arms, and the longitudinal recess arranged to intersect the receiving bores, at least one closable bottom opening in the pump housing which begins at the camshaft chamber and extends in a projection of the receiving bores, assembly recesses beginning at the camshaft chamber and machined into the wall of each receiving bore and arranged to discharge into the longitudinal recess, said assembly recesses enabling the removal and installation of the regulating sleeves, and further wherein said assembly recesses, each for two adjacent receiving bores at a time, are embodied by means of a single aperture which interrupts a housing web between said two receiving bores, beginning at the camshaft chamber and extending to approximately the level of the middle of the longitudinal recess.

4,527,963
SCROLL TYPE COMPRESSOR WITH LUBRICATING SYSTEM

Kiyoshi Terauchi, Gunma, Japan, assignor to Sanden Corporation, Japan

Filed Sep. 30, 1983, Ser. No. 537,442
Claims priority, application Japan, Sep. 30, 1982, 57-148267
Int. Cl.³ F04C *18/04, 29/02*
U.S. Cl. 418—55 **10 Claims**





1. In a scroll type compressor including a housing comprising a front end plate and a cup-shaped casing, a fixed scroll fixedly disposed within said housing and having a first circular end plate from which a first wrap extends, an orbiting scroll having a second circular end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism operatively connected with said orbiting scroll to effect the orbital motion of said orbiting scroll, a rotation preventing/thrust bearing device for preventing the rotation of said orbiting scroll while allowing orbital motion, and thus changing the volume of said fluid pockets due to the orbital motion of said orbiting scroll, the improvement comprising:

said first circular end plate dividing the interior of said housing into a suction chamber and a discharge chamber;

said rotation preventing/thrust bearing device positioned in said suction chamber between an inner end surface of said front end plate and an end surface of said second circular end plate of said orbiting scroll; and

a fluid inlet port in said cup-shaped casing for introducing a mixture of gas and lubricant into said suction chamber, said fluid inlet port positioned opposite and opening onto said rotation preventing/thrust bearing device so that the mixture of gas and lubricant introduced into said suction chamber through said inlet port strikes against said rotation preventing/thrust bearing device, said rotation preventing/thrust bearing device separating the lubricant from the gas.

4,527,964
SCROLL-TYPE PUMP

Takao Mitsui, Aichi; Hideaki Sasaya, and Mitsuo Inagaki, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 3, 1983, Ser. No. 538,571
Claims priority, application Japan, Nov. 16, 1982, 57-201561
Int. Cl.³ F01C *1/04;* **F04C** *18/04*
U.S. Cl. 418—55 **10 Claims**

1. A scroll-type pump comprising:

a housing assembly;

a stationary scroll member having scrolling extending greater than 360° and a generally polygonal shape, and being fixedly arranged in said housing assembly;

a movable scroll member having scrolling extending greater than 360° and a generally polygonal shape and being movably arranged in said housing assembly;

said housing assembly having an outer shape which is similar with said polygonal shape of said scroll members;

means for supporting said movable scroll member in such a manner that said movable scroll member rotates around an axis other than its own axis while maintaining contact with said stationary scroll member;

chambers being formed between said stationary scroll member and said movable scroll member, each chamber moving circumferentially and radially inward while the volume thereof is gradually decreased when said movable scroll member rotates;

means for introducing fluid into each chamber when the volume thereof is large; and

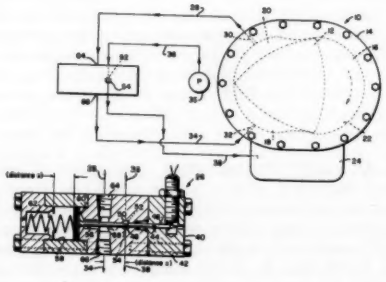
means for removing fluid from each chamber when the volume thereof is small;

each scroll member having a shape which corresponds to a curve and each scroll member extending, in a plane transverse to the axis thereof, outwardly while turning about an axis other than its own axis, said curve being comprised of radially outwardly convexed arc sections of a small radius and radially outwardly convexed arc sections of a large radius alternately arranged in the direction along which each scroll member extends and being smoothly connected to each other.

4,527,965
LUBRICATION MEANS FOR CYCLICALLY DISCHARGING LUBRICANT INTO A FLUID WORKING CHAMBER

George L. Markley, Montour Falls, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 29, 1984, Ser. No. 615,083
Int. Cl.³ F01C *21/04;* **F01M** *1/08;* **F16N** *7/34*
U.S. Cl. 418—88 **31 Claims**



1. In a machine, such as a gas compressor, gas expander, engine, pump, or the like, having a piston movably disposed within a chamber in which at least a first portion of said chamber defines an inlet area for admitting thereinto a fluid having the properties of a given velocity, a given volume, and a given

pressure, and a second portion of said chamber defines a fluid-working area in which such admitted fluid has at least one of the properties thereof altered by interaction of surfaces of said chamber and said movable piston, means for lubricating said surfaces, comprising:

first means for providing a source of lubricant under pressure;

a device having means comprising a repository for confining therein a volume of lubricant conducted thereto, and having means movable, along a given axis which traverses said repository, in response to fluid under pressure addressed thereto, for carrying lubricant along said axis from said repository to a lubricant-discharging location, in said device which is axially spaced apart from said repository;

one conduit means, communicating said first means and said repository, for conducting lubricant to said repository;

another conduit means, communicating one of said areas with said lubricant-carrying means, for conducting pressured fluid from said one area and addressing the same to said latter means to effect lubricant-carrying movement thereof; and

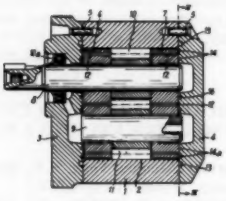
a further conduit means, communicating the other of said areas with said lubricant-discharging location, for conducting lubricant from said latter location into said other area for lubricating said surfaces.

4,527,966

APPARATUS FOR AN HYDROSTATIC COMPENSATION OF HYDRAULIC PUMPS AND MOTORS OF GEAR TYPE

Roger Laumont, La Varenne St. Hilaire, France, assignor to Hydroperfect International Hpi, Chennevieres, France

Filed Mar. 21, 1984, Ser. No. 591,796
Claims priority, application France, Mar. 22, 1983, 83 04650
Int. Cl.³ F04C *15/00, 2/14*
U.S. Cl. 418—132 **5 Claims**



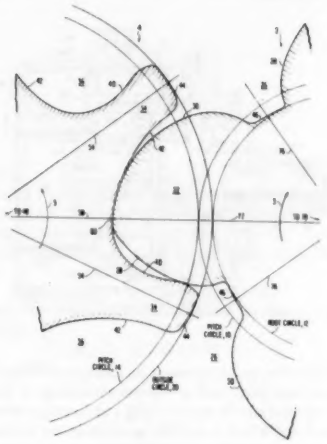
1. An apparatus for hydrostatic compensation of hydraulic pumps and motors of gear type in which two intermeshing gears are mounted on shafts which are supported by bearings or journal-bearings slidable within a cavity of a pump or a motor housing, said pump or motor housing being closed on both lateral sides by covers, compensation chambers being provided between the bearings and the covers, wherein said chambers are delimited by grooves respectively provided in faces facing the bearings and covers, a part of one side of the grooves provided in the bearings being in alignement with one side of the grooves provided in the corresponding cover, and deformable tightness seals being arranged in said grooves.

4,527,967

SCREW ROTOR MACHINE WITH SPECIFIC TOOTH PROFILE

Robert A. Ingalls, Springfield, Vt., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Aug. 31, 1984, Ser. No. 645,958
Int. Cl.³ F01C *1/16, 1/24*
U.S. Cl. 418—150 **9 Claims**



1. A female rotor for a screw rotor machine comprising:

an elongated formed female rotor rotatable about a central longitudinal axis and having a pitch circle centered on said axis, said rotor having an outer diameter;

a plurality of elongated helical lobes extending longitudinally of said rotor and circumferentially spaced about said pitch circle so as to provide intervening grooves therebetween forming addendum portions outside the pitch circle and dedendum portions inside the pitch circle;

a major portion of each of said lobes extending generally radially inwardly of said pitch circle;

the profile of each of said lobes in a plane perpendicular to said axis having a tip portion and respective generally concave groove leading and trailing flank portions extending intermediate said tip portion and a root portion of the respective adjacent groove;

and wherein said lobes of said female rotor engage grooves of a male rotor defined by corresponding helical lobes of the male rotor with contact between flank portions of respective female and male rotors during rotation of one rotor relative to the other;

the improvement wherein the profile of the groove trailing flank portion of said female rotor is defined by first and second circular arc portions subscribed by first and second radii within the addendum and dedendum portions of said lobe, respectively, providing a smooth uninterrupted surface, starting below the pitch circle and terminating at or near the outside diameter of the rotor with the point of tangency of the first and second radii occurring at a point of zero sliding with the male rotor on said pitch circle;

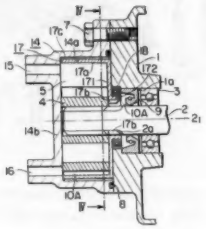
whereby, said female rotor groove trailing flank surface portion facilitates female rotor drive of the male rotor, reduction in blow holes formed between the female and male screw rotors, and reduction of spreading forces acting on the rotors opposing their rotation and loading of bearings mounting said rotors for rotation about their axes.

4,527,968

VANE-TYPE PUMP WITH ROTATABLE CASING THEREIN DRIVEN FROM PUMP SHAFT

Hitoshi Ogawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,635
Claims priority, application Japan, Mar. 4, 1983, 58-31753[U]
Int. Cl.³ F04C *2/348*
U.S. Cl. 418—173 **4 Claims**



1. A vane-type pump comprising:
a frame;
a splined shaft rotatably supported on said frame;
a rotor splined to said shaft concentric with the axis of said shaft and having a plurality of radial slots therein;
a plurality of vanes radially shiftably mounted in said radial slots;
a housing secured to said frame around said shaft and rotor and having a cylindrical inner periphery the center of which is eccentric with respect to the axis of said shaft and an end wall closing said housing at the end remote from said frame, said frame closing the other end of said housing; and
a cylindrical casing rotatably mounted between said cylindrical inner periphery of said housing and the outer periphery of said rotor and having a cylindrical inner periphery against which the radially outer ends of said vanes abut to define an operating chamber;
said pump having a suction port opening into said housing and a discharge port opening out of said housing in communication with said operating chamber;
said casing having an internal gear thereon larger in diameter than said splined shaft and in toothed engagement with said splined shaft for rotating said casing by said shaft in the same direction as the rotational direction of said rotor but at a speed different therefrom.

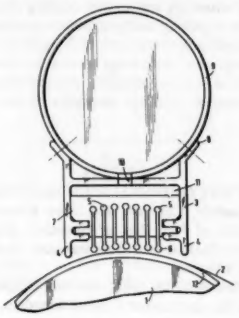
4,527,969

APPARATUS FOR THE ELECTRIC PRETREATMENT OF NON-CONDUCTIVE FOILS

Eckhard Prinz, Rotenbek, and Bruno Kluss, Hamburg, both of Fed. Rep. of Germany, assignors to Softal Electronic GmbH, Hamburg, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,318
Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219538
Int. Cl.³ B29D *7/22*; H01T *19/04*
U.S. Cl. 425—174.8 E **5 Claims**

1. An apparatus for electrically treating a foil to increase the surface tension of the foil and for connection to a vacuum source, said apparatus comprising:
a roller electrode, having a circumference and connected to receive a first potential, over which the foil is passed;
a casing connectable to the vacuum source and having sides positioned close to the roller electrode such that, when said casing is connected to the vacuum source an evacuated area defined by a portion of the circumference of said roller electrode on one side and said casing on the remaining sides is formed; and
at least three knife electrodes housed within said casing and connected to receive a second potential higher than said first potential, said knife electrodes being positioned substantially parallel and close to one another and extending



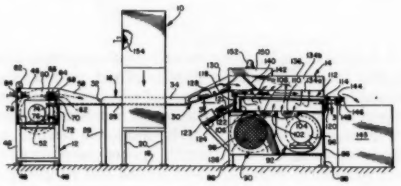
across said roller electrode in a direction perpendicular to the direction of travel of the film, the distances between the discharge edges of said knife electrodes and the surface of the roller elctrode being substantially constant.

4,527,970

APPARATUS FOR INJECTION MOLDING POLYMERIC ARTICLES

Jackie D. Murley, Big Spring, Tex., assignor to Co-Exx Pipe Company, Inc., Big Spring, Tex.

Filed Jul. 19, 1983, Ser. No. 515,296
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—404 **25 Claims**



1. Apparatus for making injection molded polymeric articles, said apparatus comprising:
a. An injection molding machine adapted to repetitively mold like articles from a polymeric resin, said machine further comprising at least one mold cavity, means for injecting a polymeric resin into each said mold cavity to form a molded polymeric article; means for partially cooling each said molded polymeric article within said mold cavity, and means for ejecting each said partially cooled molded polymeric article from each said mold cavity;
b. Receiving means adapted to receive said molded polymeric article after being ejected from said mold cavity;
c. Vibratory pneumatic cooling means adapted to further dissipate thermal energy from each said partially cooled molded polymeric article, said vibratory pneumatic cooling means further comprising a perforated vibratory grid, means for oscillating said perforated vibratory grid, means for directing a gaseous fluid upwardly through the perforations in said perforated vibratory grid, and side walls extending longitudinally along the sides of said perforated vibratory grid and upwardly therefrom;
d. Pneumatic transport means adapted to pneumatically propel each molded polymeric article from said receiving means onto said vibratory pneumatic cooling means, said

pneumatic transport means further comprising a sweep blower adapted to discharge a flow of gaseous fluid across said receiving means at a pressure sufficient to propel each molded polymeric article disposed in said receiving means onto said vibratory pneumatic cooling means; and

e. Means for actuating said pneumatic transport means after each molded polymeric article is ejected from said mold cavity onto said receiving means so that said molded polymeric article is thereafter propelled onto said vibratory pneumatic cooling assembly from said receiving means.

4,527,971

DISC RECORD STAMPER ALIGNMENT

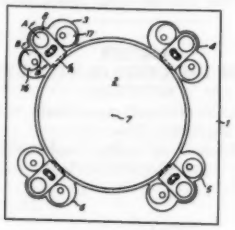
Hermann Strausfeld, Cologne, and Theo Kroenchen, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to EMI Electrola Gesellschaft mit beschrankter Haftung, Cologne, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 532,993

Claims priority, application United Kingdom, Sep. 17, 1982, 8226625

Int. Cl.³ B29C *1/00*

U.S. Cl. 425—409 **5 Claims**



1. A press block for a disc record press comprising a mould member to which a stamper plate is affixed, an outer support member surrounding the periphery of said mould member, said support member supporting said mould member such that said mould member may be adjustably positioned relative to said support member, and an alignment system comprising at least three adjustment means disposed around said periphery, each adjustment means comprising a lever arm pivotally mounted to said outer support member, said lever arm having a curved surface which engages said mould member at its periphery, said lever arm having a scale marked thereupon adjacent to said curved surface, said lever arm being disposed between a pair of opposing cams, said cams being pivotably mounted to said outer support member such that said cams may be rotated to cause rotation of said lever arm, thereby enabling the adjustable displacement of said mould member relative to said support member in a lockable manner.

4,527,972

MACHINE FOR PRODUCING ICE-CREAM

Halvard I. Carlsson, Egnahemsvägen 6, S-445 00 Surte, Sweden

Filed Jul. 12, 1984, Ser. No. 630,241

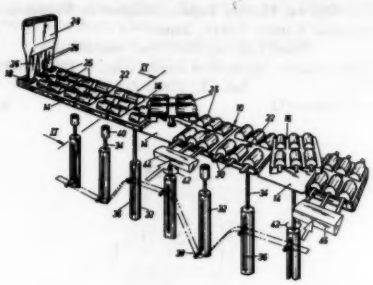
Claims priority, application Sweden, Feb. 8, 1984, 8400638

Int. Cl.³ A23G *3/16, 3/18*

U.S. Cl. 425—440 **9 Claims**

1. In a machine for producing ice-cream units, said machine comprising a belt conveyor, a number of trays forming said belt conveyor, a chain driving said belt conveyor, and plates on said belt conveyor, said plates positioned on said trays and having molds formed therein for reception of ice-cream paste, the improvement comprising:

said plates being essentially square, and means for lifting one of said plates from said conveyor and turning said one of said plates at least a quarter of a turn said plates being arranged to be lifted off their respective supporting trays and adapted to be positioned on said trays in different



positions, each one of said positions corresponding to the turning of the plate over at least a quarter of a turn.

4,527,973

PRECALCINER FOR CEMENT RAW MEAL

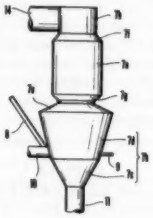
Takehiko Kondoh, and Masahiko Kitajima, both of Yamaguchi, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Dec. 14, 1983, Ser. No. 561,579

Claims priority, application Japan, Dec. 23, 1982, 57-224888; May 17, 1983, 58-84980

Int. Cl.³ F27B *15/00, 7/02*

U.S. Cl. 432—58 **8 Claims**



1. In a precalciner for cement raw meal of the type wherein the precalciner is connected between a rotary kiln and a suspension preheater for raw meal and provided with an independent heat source, the improvement wherein said precalciner is divided into an upper precalciner part and a lower precalciner part, the upper part is shaped into a cylinder having an upper end and a lower end and a diameter smaller than a maximum diameter of said lower part, the lower part is constituted by a lower inverted conical portion with its lower end connected to a kiln exhaust gas feed duct, and an upper inverted conical portion connected to an upper end of said lower inverted conical portion, said upper inverted conical portion having a cone angle smaller than that of said lower inverted conical portion, and wherein an upper end of said upper inverted conical portion is connected to said lower end of said upper part through throttle means and precalciner exhaust gas is discharged from said upper end of said upper part.

4,527,974

CERAMIC ROLLER-HEARTH KILN WITH CONTROLLED COMBUSTION AND COOLING

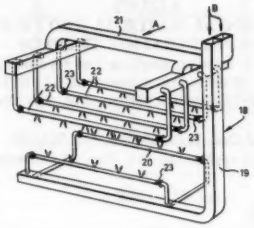
Dario Carraroli, Via Tiraboschi, 46, 41100 Modena, and Giordano Giavelli, Piazza Salvo D'Acquisto, 12, 41049 Sassuolo (Modena), both of Italy

Filed Oct. 12, 1982, Ser. No. 433,731

Claims priority, application Italy, Oct. 14, 1981, 46893 A/81

Int. Cl.³ F27D *15/02;* **F27B** *3/04*

U.S. Cl. 432—78 **8 Claims**



1. A ceramic kiln through which objects to be baked are moved by a conveyor, said kiln comprising a preheating zone, a baking zone downstream of the preheating zone, burner means in said baking zone for baking objects moving through the baking zone, a cooling section downstream of the baking zone and comprising in succession, a fast cooling zone, an induction cooling zone, an air cooling zone, and a fan cooling zone, said fast cooling zone comprising means for directing cold air jets onto objects on the conveyor, said induction cooling zone comprising first and second indirect heat exchanger tube bundles disposed immediately above and below the conveyor for removing heat by conduction to air flowing through tubes of the tube bundles without adding air to the atmosphere in the induction cooling zone of the kiln, each tube bundle comprising coplanar bundles of horizontal transversely extending tubes connected to respective external atmospheric cooling air supply headers and external hot air discharge headers; fan means for supplying atmospheric air to the atmospheric air headers, and control means for controlling the discharge of air from the hot air headers, to control the flow of cooling air through the tubes, said air cooling zone comprising means for admitting cooling air through apertures below the conveyor and means for withdrawing said cooling air from above the conveyor, said fan cooling zone comprising a plurality of fans blowing cooling air toward the conveyor, means for collecting hot gaseous products of combustion from the burner means of the baking zone, and comprising means for withdrawing the hot products of combustion from the baking zone at a location between the preheating zone and the upstream end of the baking zone, means for mixing the hot products of combustion with air and feeding the mixture to the preheating zone, and means for removing cooling air introduced in the fast cooling zone at a location downstream of the fast cooling zone, and upstream of said air cooling zone.

4,527,975

COSMETIC ORTHODONTIC DEVICE

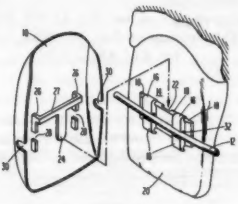
Joseph Ghafari, 2400 Chestnut St., Philadelphia, Pa. 19103, and Herbert K. Land, III, 328 S. 43rd St., Philadelphia, Pa. 19104

Filed Mar. 19, 1984, Ser. No. 591,318

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—8 **11 Claims**

1. A dental appliance comprising a labial surface, adapted to look like the labial surface of at least one complete tooth, and to completely cover said tooth and all orthodontic hardware thereon, and, on its lingual surface, means for detachably se-



curing said appliance to the orthodontic hardware without interference with subsequent orthodontic movement.

4,527,976

DENTIST CHAIR

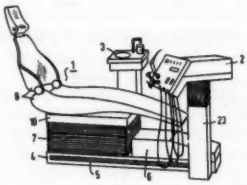
Wolfgang Behringer, Bensheim; Klaus Stöckl, Heppenheim, and Rolf-Juergen Weiland, Lautertal, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,160

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228853

Int. Cl.³ A61G *15/00*

U.S. Cl. 433—33 **7 Claims**



1. An improved dentist chair with a top portion carrying a seat, with a chair bottom containing a height-adjusting system for the seat and with a doctor's apparatus attached to said chair bottom, said doctor's apparatus being provided with various media, such as air, water or electricity, said media being routed to said doctor's apparatus through said chair bottom by supply lines from a connection box disposed at the floor, wherein the improvement comprises:

(a) a first hookup portion contained within said chair bottom for connecting said doctor's apparatus to said chair bottom, said hookup portion including a first carriage with first coupling means for mechanically coupling said doctor's apparatus to said chair bottom and second coupling means connected with said various media supply lines; and

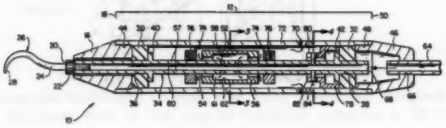
(b) a first counter-part included with said doctor's apparatus for connecting said doctor's apparatus to said chair bottom, said first counter-part having first counter-coupling means matching complementarily said first coupling means of said first hookup portion and further including second counter-coupling means for coupling with said second coupling means of said first hookup portion when the first coupling means and first counter-couping means are joined together;

whereby when said doctor's apparatus is mechanically attached at said chair bottom, the media supply lines are simultaneously connected together.

4,527,977
GAS-DRIVEN DENTAL SCALER HAVING TORQUE REACTION MEANS

John E. Nash, Downingtown, Pa., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 12,631, Feb. 16, 1979, abandoned. This application Feb. 13, 1981, Ser. No. 234,283
Int. Cl.[3] A61C *1/07*
U.S. Cl. 433—120 15 Claims

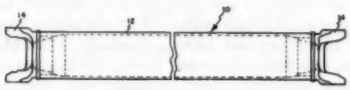


1. A dental scaler comprising:
elongated casing means having a proximal end and a distal end;
resilient support means within said casing means;
a substantially rigid shaft supported within said elongated casing means by said resilient support means;
work tool connecting means attached to the distal end of said shaft, said work tool connecting means capable of operatively connecting a work tool to the distal end of said shaft;
means for imparting vibration to said resiliently supported shaft when said dental scaler is energized to provide vibratory movement to a work tool connected to said work tool connecting means; and
torque reaction means affixed to said elongated casing means and associated with said shaft for resisting torque applied to said shaft during torsional engagement or disengagement of a work tool with said work tool connecting means,
said torque reaction means including lost motion connecting means for limiting rotation of said shaft at a first position and a second position during torsional engagement or disengagement, respectively, of a work tool with said work tool connecting means, said torque reaction means further including means for returning said shaft to an operative position between said first position and said second position after torsional engagement or disengagement of a work tool with said work tool connecting means, said lost motion connecting means substantially preventing transfer of vibration from said shaft to said casing means when said shaft is in said operative position during operation of the scaler.

4,527,978
DRIVESHAFT

Barry L. Zackrisson, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 13, 1984, Ser. No. 579,350
Int. Cl.[3] F16C *3/00*
U.S. Cl. 464—183 11 Claims



1. A driveshaft comprising a heat-treated aluminum alloy tube with first and second ends, said tube having a constant wall thickness throughout most of its length and an increased wall thickness adjacent each end, the outside diameter of said tube at each end being at least as great as the outside diameter of said tube throughout its length, a first aluminum alloy connection member partially telescoped within said first end of said tube and joined to said tube by welding, and a second aluminum alloy connection member partially telescoped within said second end of said tube and joined to said tube by welding, wherein the hardness of each end of said tube is about T1 or less adjacent each end thereof.

4,527,979
POWDERED DENTAL MATERIAL AND PROCESS FOR THE PREPARATION THEREOF

John W. McLean, London, England, and Oswald Gasser, Seefeld, Fed. Rep. of Germany, assignors to ESPE, Fabrik pharmazeutischer Präparate GmbH, Seefeld, Fed. Rep. of Germany

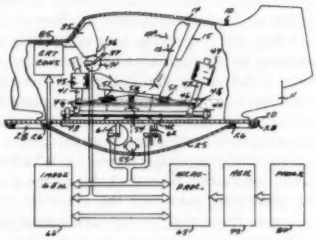
Filed Dec. 21, 1983, Ser. No. 563,749
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248357
Int. Cl.[3] A61K *6/08*
U.S. Cl. 433—228 19 Claims

1. A powdered dental material composition comprising (a) calcium aluminum fluorosilicate glass and (b) a member selected from the group consisting of precious metals suitable for dental use and alloys of said precious metals with one another and/or with up to 40% by weight of non-precious metals, based on the weight of the alloy, at least a portion of the component (a) being in the form of a sintered mixture with the component (b).

4,527,980
FLIGHT SIMULATING VIDEO GAME

Robert W. Miller, 1235 - 19th St., Hermosa Beach, Calif. 90254

Filed Apr. 7, 1983, Ser. No. 432,244
Int. Cl.[3] G09B *9/08*
U.S. Cl. 434—55 8 Claims

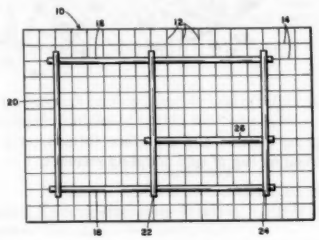


1. Apparatus conformed to simulate the angular motions of a flight vehicle comprising:
an enclosure provided with a seat conformed to support an occupant and an accessway for ingress and egress to said seat;
a parabolic support surface interposed between said enclosure and ground conformed for angular displacement relative ground in response to changes of center of gravity alignment of said enclosure; and
moveable control means deployed in said enclosure and provided with weights for changing the alignment of said center of gravity, including a plurality of pivotal members each supporting a corresponding weight, said members being adjustably linked to each other.

4,527,981
METHOD AND APPARATUS FOR DESIGNING A LOG HOME

Finis L. Chisum, Box 1145, Claremore, Okla. 74017

Continuation of Ser. No. 906,060, May 15, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,111
Int. Cl.[3] G09B 25/04
U.S. Cl. 434—72 1 Claim

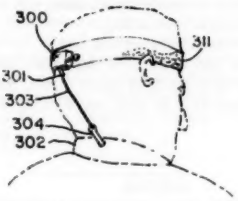


1. An apparatus for designing a scale model of given full scale log home or building design comprising:
(a) a plurality of scale model building logs at least sufficient in number to construct said design, each representative of commercially available logs, constructed with selected values of diameter and length, with selected added features of slots, notches, cutouts, and made to a selected scale S;
(b) each model log being prominently marked with a characteristic code designation as to its length, diameter, slots, notches, cutouts, by which it and said full scale counterpart can be fully specified in a bill of materials for manufacture; and
(c) a selected surface on which said model logs can be assembled into a selected structure, said surface having a rectangular grid drawn to said selected scale S.

4,527,982
BODY COORDINATION TRAINING AID

Norman Salzman, 10508 Gainsborough Rd., Potomac, Md. 20854, and Edward Wellner, 4028 Hunt Rd., Fairfax, Va. 22031

Continuation-in-part of Ser. No. 315,496, Oct. 27, 1981, Pat. No. 4,392,830. This application Jun. 30, 1983, Ser. No. 509,784
Int. Cl.[3] A63B 69/36, 69/38
U.S. Cl. 434—258 6 Claims

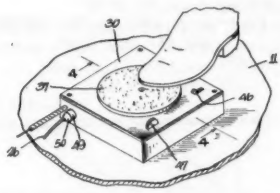


1. A body coordination training aid, comprising:
an audio oscillator;
a power source for said audio oscillator;
an adjustable electrical contact assembly, comprising first and second adjustable electrodes positioned to form a single-pole double-throw switch with said rotatable contact assembly;
a rotatable contact assembly positioned relative to said adjustable electrical contact assembly for completing an electrical circuit therebetween;
means to electrically connect said audio oscillator to said power source via said adjustable electrical contact assembly and said rotatable contact assembly;
means to secure said adjustable electrical contact assembly to a portion of a user's body; and
means to mechanically couple said rotatable contact assembly to a different portion of the user's body whereby relative movement between the portion of the user's body supporting said adjustable electrical contact assembly and the portion of the user's body to which said rotatable contact assembly is mechanically connected will result in rotation of said rotatable contact assembly for making and breaking electrical contact between said adjustable electrical contact assembly and said rotatable contact assembly.

4,527,983
TROLLING CONTROL FOR BOATS

Jerry N. Booth, 8176 Fewtown Rd., Atwater, Ohio 44201

Filed Jul. 27, 1983, Ser. No. 517,722
Int. Cl.[3] B63H 21/26
U.S. Cl. 440—7 10 Claims

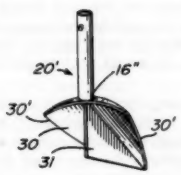


1. A control for a trolling motor which is swingably mounted on a boat for the purpose of steering the latter, comprising:
shaft and bearing means securable to the said boat, said shaft mounted in said bearing for rotary movement and additionally mounted therein for movement in a direction along the axis of said shaft,
a generally planar plate secured to said shaft for rotary movement therewith in the plane of the plate and also movement transverse to said rotary movement along the axis of said shaft,
means effected by rotary movement of said plate to cause swinging movement of said motor and consequent steering operation of said motor, and
a switching device controlling said motor having an operator member arranged to effect operation of said switching device when said plate is moved in a direction along the axis of said shaft to thereby effect operation of said trolling motor to propel said boat.

4,527,984
WATER SKIS AND OARING STICKS

Serge Gilbert, 355, 20th S., Quebec, Canada G1L 1Z9

Filed May 3, 1984, Ser. No. 606,692
Int. Cl.[3] A63C 15/00
U.S. Cl. 441—76 4 Claims



1. A pair of water oar sticks for use as propulsion means with

a pair of flotation skis, each of said sticks comprising an elongated pole having a handle at its upper end, a paddle secured to its lower end and a float member fixedly connected to said pole proximate said paddle and intermediate the latter and said handle, said paddle being a generally isosceles triangular plate having its two equal side edges converging toward a point which is the lowest point of the paddle, said paddle having a straight cross-section when taken in a plane containing said point of said plate and the longitudinal axis of at least the lower portion of said pole, said paddle being curved transverse of said axis to define a concave downstream surface and a convex upstream surface, said paddle being further inclined in an upstream direction at about 45 degrees relative to said axis, and further including a generally triangular plate-like keel extending downstream from said concave surface, beyond said side edges and lying in said plane to provide directional control of said stick.

4,527,985

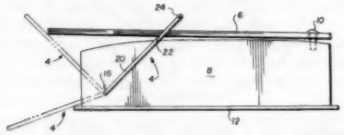
FOWL CALL SILENCER

James R. Zoschg, Box 1300, R.D. #1, and Gary E. Lisac, Box 75, both of Shinglehouse, Pa. 16748

Filed Apr. 26, 1983, Ser. No. 488,793

Int. Cl.³ A63H *5/00*

U.S. Cl. 446—397 **6 Claims**



1. Apparatus comprising:

a sound box means having a portion adapted to vibrate and create sound,

arm means for causing said portion to vibrate when said arm means moves in contact with said portion,

means mounting said arm means on said sound box means, and silencer means pivotally mounted thereto for preventing said arm means from causing vibrations of said sound box means in a first position and for allowing said arm means to cause said vibrations in a second position, wherein said silencer means comprises an elongated element and a shank extending transversely to said elongated element, said shank being pivotally mounted to said sound box means at a location so that said arm means maintains said elongated element between said arm means and said box means and in a position such that said arm means does not engage said portion of said sound box means in said first position thereof, the length of said shank being such that said shank extends at an oblique angle with respect to said arm means when said elongate element is in said first position.

4,527,986

RESILIENT ANTI-BACKLASH SHAFT COUPLING

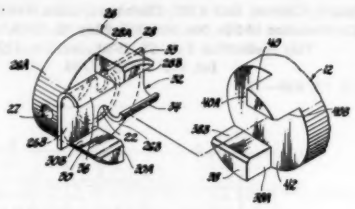
Bobbie D. Bridgewater, and Robert E. Young, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1983, Ser. No. 534,796

Int. Cl.³ F16D *3/52;* **F02P** *7/00*

U.S. Cl. 464—73 **4 Claims**

1. A drive coupling for driving a distributor shaft of an ignition distributor from the camshaft of an internal combustion engine comprising, a coupling member secured to the shaft of the ignition distributor having a pair of circumferentially spaced axially extending first lugs, a metallic spring member secured to said coupling member having a pair of curved spring portions, and a camshaft having a pair of circumferentially spaced axially extending drive lugs, each drive lug having a pair of straight flat surfaces located substantially normal to each other that respectively engage an outer wall of a



curved spring portion and a surface formed on a said first axially extending lug of said coupling member.

4,527,987

SPROCKET WHEEL AND METHOD OF MAKING SAME

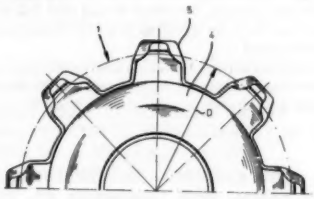
Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,434

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244361

Int. Cl.³ F16H *55/30*

U.S. Cl. 474—152 **2 Claims**



1. A sprocket wheel for conveyor chains in mining applications comprising a forged, austenitized, oil-quenched and annealed body consisting essentially of:

0.7 to 1.0% by weight manganese,

0.7 to 2.2% by weight chromium,

0.3 to 0.6% by weight molybdenum,

0.5 to 2.2% by weight nickel,

up to 0.45% by weight carbon, and

balance iron and usual steel impurities, which is surface-hardened to a depth of about 2 mm, has a hardness of substantially 55 to 60 HRC and a strength of 1400 to 1600 N/mm^2.

4,527,988

POROUS CONTRACEPTIVE DEVICE WITH AN INTERSTITIAL LIQUID

Peter L. Lutz, 561 Satinwood Dr., Miami, Fla. 33149, and Joseph D. Richard, 3647 St. Gaudens Rd., Miami, Fla. 33133

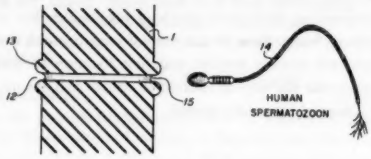
Filed Sep. 20, 1982, Ser. No. 420,325

Int. Cl.³ A61F *5/44*

U.S. Cl. 604—349 **3 Claims**

1. A permeable contraceptive device comprising a condom at a thin flexible synthetic material having a wall portion with a plurality of regularly open spaced holes which are of a uni-

form size and cross-sectional diameter in said condom wall and which are sufficiently small to prevent the passage of spermatozoon through said openings in said condom wall and further has a interstitial liquid within the open holes.



4,527,989

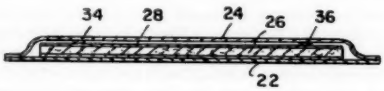
ELASTICIZED DISPOSABLE DIAPER

Hamzeh Karami, Embourg, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 314,907, Oct. 26, 1981, abandoned, which is a continuation of Ser. No. 99,784, Dec. 3, 1979, abandoned. This application Jan. 17, 1983, Ser. No. 458,515

Int. Cl.³ A61F *13/16*

U.S. Cl. 604—385 A **1 Claim**



1. A disposable diaper comprising a backing sheet, an absorbent pad assembly on said backing sheet, a top sheet overlying said absorbent pad assembly, said top sheet being secured to said backing sheet on at least two opposite peripheral edges thereof, opposed elastic members secured to said backing sheet outwardly of said absorbent pad in the central portions of said two opposite peripheral edges to define crotch seals along the side edges of said diaper, said absorbent pad assembly being of an hour-glass shape defining ears spaced from said crotch area, said elastic members extending the entire length of said ears, said absorbent pad assembly including an absorbent pad and an upper tissue wadding sheet overlying said absorbent pad, said elastic members being bonded to said backing sheet spaced outwardly of said absorbent pad assembly and along said crotch area and being spaced from said crotch area less than ¾ inch from said absorbent pad assembly, said elastic members being bonded to said tissue wadding sheet along the entire length of said ears so that the minimum resistance of said tissue wadding sheet relative to said absorbent pad will result in the tension on said elastic members forming only pleats in said crotch area and no transverse creases or pleats in said absorbent pad in said crotch area.

4,527,990

ELASTICIZED GARMENT AND METHOD FOR ITS MANUFACTURE

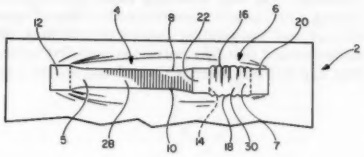
Wayne C. Sigl, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 30, 1982, Ser. No. 430,623

Int. Cl.³ A61F *13/16*

U.S. Cl. 604—385 A **11 Claims**

1. An article comprising a flexible substrate, elastic material having a surface area and being bonded to the substrate over a portion of the surface area of the elastic material, and shrinkable means having a surface area and being bonded to the substrate over a portion of the surface area of the shrinkable means and bonded to the elastic material over another portion of the surface of the shrinkable means that is less than the surface area of the elastic material, the shrinkable means providing a force along a direction between the area of the bond of the elastic material to the substrate and the area of the bond



of the shrinkable means to the substrate for gathering the substrate upon shrinking whereby, when the substrate is extended, the elastic material applies gathering force to the substrate.

4,527,991

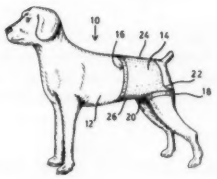
SMALL ANIMAL PROTECTIVE GARMENT

Johnnie Msarsa, 404 Smokey View Rd., Knoxville, Tenn. 37920

Filed Jul. 21, 1983, Ser. No. 516,207

Int. Cl.³ A01K *23/00*

U.S. Cl. 604—399 **11 Claims**



1. A garment for small animals of both sexes to absorb and collect waste body fluids comprising:

an outer flexible support garment, having a front side and a back side suitable for fitting over such an animal's hind quarters, said support garment defining a waist aperture to fit around the body of said animal and a pair of leg apertures for passing the animal's rear legs therethrough, said waist aperture and said pair of leg apertures, each including a resilient material therearound such that said apertures fit snugly around the animal's body and rear legs respectively, said support garment further defining a tail aperture located at said back side between and proximate said pair of leg apertures to allow the tail of said animal to pass therethrough, and being of such size and location so that the anal opening of said animal is not covered;

a first first portion of a cooperating two-piece attaching means secured to said support garment at a first location, said first location being at said front side and adjacent to said tail aperture;

a second first portion of a cooperating two-piece attaching means secured to said support garment at a second location, said second location adjacent said waist aperture, and at said front side opposite and at a first selected distance from said first first portion; and

a disposable pad having an absorbant face and a liquid impervious face, said pad defined by a pair of side edges, an attaching edge, and a free edge opposite said attaching edge, said pair of side edges being spaced from each other a second selected distance and extending a third selected distance between said attaching edge and said free edge, said third selected distance being less than said first selected distance and greater than said second selected

distance, said attaching edge extending between said pair of side edges and having a second portion of said cooperating two-piece attaching means secured proximate thereto at a mid-point between said side edges and on said liquid impervious face, said free edge also extending between said side edges at substantially said third selected distances from said attaching edge, said disposable pad having a first selected position such that said second portion of said cooperating two-piece attaching means attaches to said first first portion at said first location such that said free end extends toward said second location so that when said garment is on said small animal, said disposable pad will be located to collect and absorb urine and estrous fluid discharge by a female animal, and a second selected position such that said second portion of said cooperating two-piece attaching means attaches to said second first portion at said second location such that said free end extends toward said first location so that said disposable pad will be located to collect and absorb urine discharged by a male animal.

4,527,992

PROCESS FOR THE PRODUCTION OF WATERPROOF LEATHERS AND SKINS

Hans-Herbert Friese, and Wolfgang Prinz, both of Monheim, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,244

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304120

Int. Cl.³ C14C *9/02, 9/00, 11/00*

U.S. Cl. 8—94.21 **15 Claims**

1. In the process for the production of waterproof leathers and skins by the steps of tanning, or tanning and retanning, or tanning and dyeing, stuffing and impregnating using copolymers containing carboxyl groups, and fixing, the improvement consisting essentially of, after tanning or after tanning and dyeing the leather and skins, treating said leathers and skins successively in the same bath first with from 3% to 8% by weight, based on the weight of said leathers and skins of stuffing agents (A) having acid numbers of from 5 to 100 and selected from the group consisting of oxidized C_{18}–C_{26} aliphatic hydrocarbons, oxidized and partially sulfonated C_{18}–C_{26} aliphatic hydrocarbons, oxidized C_{32}–C_{40} waxes and oxidized and partially sulfonated C_{32}–C_{40} waxes and second with from 0.5% to 3% by weight, based on the weight of said leathers and skins of impregnating agents (B) in the form of salt selected from the group consisting of the alkali metal, ammonium and lower alkylamine of a copolymer of from 60 to 95 mol percent of an unsaturated acid selected from the group consisting of acrylic acid and methacrylic acid and from 5 to 40 mol percent of monomer selected from the group consisting of methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, acrylamide, acrylonitrile, methyl methacrylate, ethyl methacrylate, propyl methacrylate, butyl methacrylate, methacrylamide and methacrylonitrile, said copolymer having a molecular weight of from 800 to 10,000, followed by acidification, as said stuffing and impregnating steps.

4,527,993

PROCESS FOR PRODUCING TRANSFER PRINTING PAPERS WITH FOAMED AQUEOUS INK

Claus Schuster, Hofheim am Taunus, and Horst Homuth, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,222

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310689

Int. Cl.³ B41M *5/26;* **D06P** *5/13*

U.S. Cl. 8—471 **5 Claims**

1. A process for producing transfer papers for thermoprinting with sublimable dyestuffs on printing machines customary in textile printing, which comprises foaming one or more aqueous liquors containing sublimable dyestuff and anionic or non-ionic surfactants having high foaming power into finely porous and stable foams, printing the transfer carrier in the desired pattern with each of the foams thus generated, and then drying this transfer carrier.

4,527,994

PROCESS FOR MASS-COLORING NYLON WITH 1:? CHROMIUM COMPLEX AZO DYE

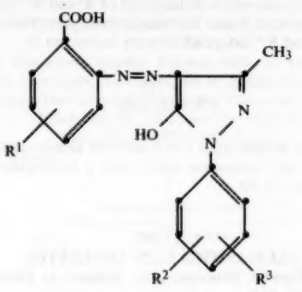
Paul Lienhard, Frenkendorf, and Werner Saar, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,466

Int. Cl.³ C09B *45/00*

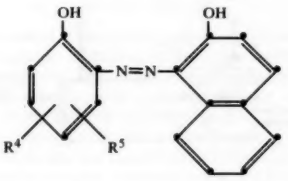
U.S. Cl. 8—494 **10 Claims**

1. A process for mass-colouring nylon which comprises using as dye either mixtures of the 1:2 chromium complex of a monoazo dye of the formula I



(I)

in which R^1 and R^3, independently of each other, are each —H or —Cl, and R^2 is —H, C_1–C_4-alkyl and/or —Cl, and the 1:2 chromium complexes of a monoazo dye of the formula II



(II)

in which R^4 is —H or —Cl, and R^5 is —H, —Cl, $—CH_3$, C_1–C_2-alkylsulfonyl or $—SO_2NH_2$, or a mixed 1:2 chromium complex of a monoazo dye each of the formula I and the formula II in which R^1, R^2, R^3, R^4 and R^5 are as defined above.

4,527,995

FUEL BLENDED WITH ALCOHOL FOR DIESEL ENGINE

Koichiro Itow, and Kunihiko Komiyama, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,914

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—56 **2 Claims**

1. A fuel blended with alcohol for use in a diesel engine, which comprises from 85% to 25% by volume petroleum fuel, from 10% to 40% by volume methanol and from 5% to 35% by volume higher alcohol having 10 to 16 carbon atoms as a mutual solvent for said petroleum fuel and methanol.

4,527,996

DEPOSIT CONTROL ADDITIVES - HYDROXY POLYETHER POLYAMINES

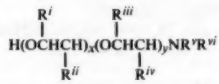
Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 547,559, Oct. 31, 1983, abandoned. This application Dec. 28, 1984, Ser. No. 687,064

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—72 **6 Claims**

1. A fuel-soluble additive for engine deposit control having the formula:



wherein R^i and R^{ii} independently are selected from the group consisting of hydrogen and alkyl groups having from 1 to 4

carbon atoms, and where at least one of R^{i} and R^{ii} has at least 2 carbon atoms; R^{iii} and R^{iv} independently are hydrogen or methyl; R^{v} and R^{vi} independently are hydrogen or

$$H(CH_2CH_2N)_2H,$$

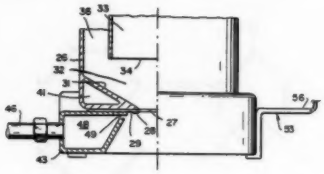
where Z is an integer from 1 to 5 with the proviso that R^{v} and R^{vi} both are not hydrogen; and x and y independently are integers from 1 to 30.

4,527,997

COAL GASIFICATION APPARATUS

Michael L. Espedal, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,396
Int. Cl.³ C10J *3/50*
U.S. Cl. 48—86 R **10 Claims**



1. The combination with a partial oxidation generator having an insulated wall which defines a reaction chamber to receive products of combustion, and an elongated access port formed in said wall and opening into said reaction chamber to receive a burner,

a burner removably registered in said access port including an elongated body having a discharge end forming a combustion chamber, passage means in the body for separately introducing a combustion supporting medium and a particulated hydrocarbon which terminates in the combustion chamber at said burner discharge end,

a burner face formed externally of said elongated body at said burner discharge end, and a discharge lip on said face which defines an access port communicated with said combustion chamber to direct products of combustion from the combustion chamber into the generator reaction chamber,

a manifold depending from said reactor chamber insulated wall being in contact with but independent of said burner face, said manifold including a torus-like body having a fluid chamber therein forming a circumferential collar about said access port and being spaced outwardly of the discharge lip,

means communicating said manifold fluid chamber with a pressurized fluid source, and

at least one opening formed in said torus-like body communicated with said fluid chamber, and being directed transversely of the burner face to deliver at least one pressurized stream of said fluid from said manifold toward said burner discharge lip.

4,527,998

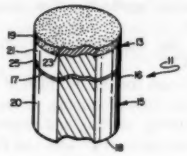
BRAZED COMPOSITE COMPACT IMPLEMENTS

Friedel S. Knemeyer, Granville, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Jun. 25, 1984, Ser. No. 624,064
Int. Cl.³ B24D *3/02*
U.S. Cl. 51—309 **26 Claims**

1. A brazed implement comprising a composite compact having an abrasive particle layer bonded to a support and a substrate bonded to said support by a brazing filler metal disposed therebetween which brazing metal is an alloy having a liquidus substantially above 700° C. and having the following composition, by weight:

Au: 18–39.50%
Ni: 3.5–14.5%



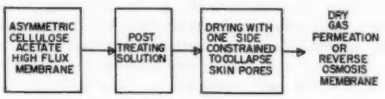
Pd: 2.5–10.5%
Mn: 7.5–9.0%
Cu: Balance.

4,527,999

SEPARATION MEMBRANE AND METHOD OF PREPARING AND USING SAME

Cheng H. Lee, Wilmington, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Filed Mar. 23, 1984, Ser. No. 592,519
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—16 **40 Claims**


ASYMMETRIC CELLULOSE ACETATE HIGH FLUX MEMBRANE
POST TREATING SOLUTION
DRYING WITH ONE SIDE CONSTRAINED TOCOLLAPSE SKIN PORES
DRY GAS PERMEATION OR REVERSE OSMOSIS MEMBRANE

1. A process of preparing an asymmetric separation membrane suitable for use as a gas-permeation or reverse-osmosis separation membrane, which process comprises:

(a) treating a preformed dried leached high-flux, asymmetric, polymeric membrane, having a top skin surface with large pores of about 50 angstroms or more and an underlying bulk porous layer, with a posttreatment solution which comprises a volatile nonsolvent for the polymer of the membrane in the presence of a swelling agent for the polymer or a solvent for the polymer; and

(b) drying the solution-treated, asymmetric membrane, while the membrane is under one-sided constraint, to provide for the evaoporating of the nonsolvent substantially through the top skin layer and for the differential collapsing of the pores of the top skin surface of the asymmetric membrane to a selected, smaller pore size of about 10 angstroms or less.

28. A gas permeation separation process for the separation of a feed gas stream by a gas separation membrane into a gas permeate fraction and a gas nonpermeate fraction, which process employes as the gas separation membrane the differential pore-collapsed separation membrane of claim 1.

4,528,000

FUEL CONDITIONING PROCESS

James C. McGill; James R. Alley, and David W. Coombs, all of Tulsa, Okla., assignors to McGill Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 337,280, Jan. 5, 1982,. This application Aug. 24, 1983, Ser. No. 525,885
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—2 G **4 Claims**

1. A fuel conditioning process for improving the quality of a fuel portion of a reservoir gas stream, the fuel portion used to fuel an engine driving a compressor which compresses the reservoir gas stream to a pressure sufficient to pass the reser-

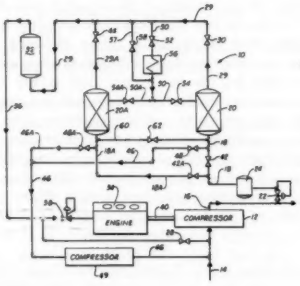
voir gas stream less than the fuel portion thereof to a gas gathering conduit, the process comprising:

passing the fuel portion of the compressed reservoir gas stream through a first adsorption vessel containing an adsorbent material capable of selectively adsorbing impurity compounds present in the reservoir gas stream to produce an outlet gas stream to produce an outlet gas stream suitable for use as a fuel for an internal combustion engine;

passing the outlet gas stream from the first adsorption vessel as fuel to the internal combustion engine which, in the operating mode thereof, powers the gas compressor;

terminating the passage of the reservoir gas to the first adsorption vessel after achieving a predetermined degree of saturation of the adsorbent material by isolating the first adsorption vessel from the compressed reservoir gas stream;

passing the fuel portion of the compressed reservoir gas stream through a second adsorption vessel containing an adsorbent material capable of selectively adsorbing impurity compounds present in the reservoir gas stream to produce an outlet gas stream suitable for use as the fuel for the internal combustion engine;



passing the outlet gas stream from the second adsorption vessel as fuel to the internal combustion engine;

regenerating the adsorbent material in the first adsorption vessel by connecting the first adsorption vessel to the compressor inlet so that the pressure in the first adsorption vessel is lowered;

backflowing a portion of the outlet gas stream from the second adsorption vessel through the first adsorption vessel for a period of time sufficient to substantially desorb the adsorbed impurities from the adsorbent material in the first adsorption vessel;

terminating the backflowing of the outlet gas stream through the first adsorption vessel and partially repressuring the first adsorption vessel with a portion of the outlet gas stream from the second adsorption vessel;

terminating the flow of the outlet gas stream from the second adsorption vessel to the first adsorption vessel;

substantially equalizing the pressure in the first and second adsorption vessels; and

passing the compressed reservoir gas stream to the regenerated first adsorption vessel.

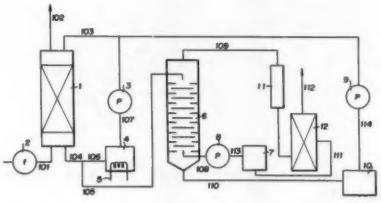
4,528,001
METHOD OF RECOVERING VOLATILE ORGANIC MATTERS

Tetsuya Yokogawa; Ryuhei Futami, both of Yokohama, and Saburo Kawahara, Kawasaki, all of Japan, assignors to The Kanagawa Prefectural Government, Kanagawa, Japan

Filed Feb. 25, 1981, Ser. No. 238,103

Int. Cl.³ B01D *47/02, 53/14*

U.S. Cl. 55—37 **6 Claims**



1. A method of recovering volatile organic matter from a gas or gas mixture containing said organic matter, which comprises subjecting a gas or gas mixture having diffused thereinto sparingly water-soluble or water-insoluble volatile organic matter in the form of vapor, mist and/or small droplets to a two-step capturing treatment wherein said gas or gas mixture is first brought into gas-liquid contact with an aqueous capturing system comprising an aqueous solution of a hemiether or hemiester of a polyalkylenepolyol selected from at least one member of the group consisting of diethyleneglycol monobutyl ether, triethyleneglycol monobutyl ether, diethyleneglycol monophenyl ether, triethyleneglycol monophenyl ether, hexaethyleneglycol monobutyrate, diethyleneglycol monobutyrate and triethyleneglycol monobutyrate capable of dissolving said volatile organic matter thereby capturing the organic matter dissolved in said aqueous system and then bringing the organic matter-absorbing aqueous system into liquid-liquid contact with a non-volatile organic liquid, immiscible with said aqueous system, such that said organic matter migrates from said aqueous system into said organic liquid, and thereafter recycling the aqueous capturing system to the first step of said two-step capturing treatment, while recovering said volatile organic matter from said non-volatile organic liquid, said aqueous capturing system and said non-volatile organic liquid being so chosen that said organic liquid has a higher distribution ratio with respect to said organic matter than said aqueous capturing system.

4,528,002
PROCESS FOR SEPARATION OF CO_2 FROM CO_2-CONTAINING GASES

Gerhard Linde, Gruenwald, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,884

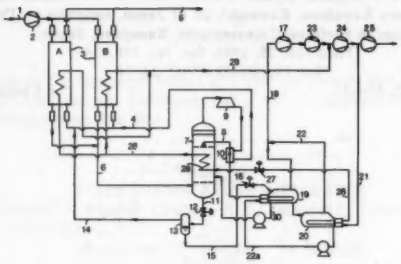
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314381

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—48 **13 Claims**

1. In a process for separating CO_2 from a CO_2-containing gas, said process comprising scrubbing said gas in a scrubbing stage with dimethylformamide to absorb CO_2, regenerating resultant loaded dimethylformamide in a regeneration stage to remove CO_2, and compressing the CO_2 to medium and then to high pressure in a plurality of pressure stages, wherein the regeneration stage is conducted by pressure reduction and heating of the loaded dimethylformamide and recycling regenerated dimethylformamide into the scrubbing stage, the im-

provement which comprises heating the loaded dimethylformamide in heat exchange with a partial stream of the product



CO_2 at a medium pressure, thereby liquefying the medium-pressure CO_2.

4,528,003

APPARATUS FOR SEPARATING GASEOUS HYDROGEN ISOTOPES

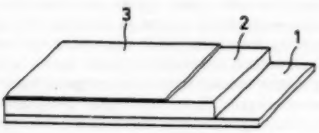
Hans Dittrich, Karlsruhe, and Hartmut Frey, Esslingen, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,401

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225751

Int. Cl.³ B01D *59/14;* **G21C** *3/02*

U.S. Cl. 55—158 **8 Claims**



1. Apparatus for separating the gaseous hydrogen isotopes protium, deuterium and tritium from a gas stream containing one or a plurality of said hydrogen isotopes and for desorbing the separated hydrogen isotopes comprising:

(a) a membrane having a thickness less than 10 micrometers which is permeable to the hydrogen isotopes and impermeable to the gas stream, the membrane having a side facing away from the gas stream and a side which is exposed to the gas stream;

(b) a getter disposed on the side of the membrane facing away from the gas stream, the getter being made of material which takes up the hydrogen isotopes by absorption at a predetermined absorption temperature and releases the absorbed hydrogen isotopes by desorption at a desorption temperature above the absorption temperature;

(c) the membrane permeable to the hydrogen isotopes covers a surface of the getter so that the getter, at the absorption temperature, absorbs hydrogen isotopes exclusively through said membrane; and

(d) membrane and getter constitute an absorption element and are permanently connected to one another.

4,528,004

AROMATIC POLYIMIDE COMPOSITE SEPARATING MEMBRANE

Hiroshi Makino; Yoshihiro Kusuki; Takashi Harada; Hiroshi Shimazaki, and Tosio Isida, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 393,819, Jun. 30, 1982,. This application Jan. 30, 1984, Ser. No. 574,644

Claims priority, application Japan, Jul. 8, 1981, 56-105619; Jul. 10, 1981, 56-107103

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—158 **22 Claims**

1. A process for producing an aromatic polyimide composite separating membrane comprising:

(A) preparing a substrate consisting of an aromatic polyimide porous membrane (1) by forming a dope solution of an aromatic polymeric material consisting essentially of at least one member selected from the group consisting of aromatic polyamides and aromatic polyamic acids and dissolved in a concentration of from 3% to 30% by weight in a solvent consisting essentially of a mixture of 100 parts by weight of at least one polar organic liquid compound capable of dissolving therein at least 5% by weight of said aromatic polymeric material and 5 to 100 parts by weight of at least one additional aromatic compound incapable of dissolving therein an amount of more then 3% by weight of said aromatic polymeric material, compatible with said polar organic liquid compound and having a poorer evaporating rate than that of said polar organic liquid compound, (2) by forming a thin layer of said dope solution, and (3) by drying said thin dope solution layer and then heating said dried layer at an elevated temperature, whereby said thin dope solution layer is converted to a thin solid porous membrane, and where said aromatic polymeric material in said dope solution contains an aromatic polyamic acid, said heating procedure is carried out under conditions adequate to convert said aromatic polyamic acid into the corresponding aromatic polyimide;

(B) coating at least one surface of said aromatic polyimide porous membrane substrate with a dilute dope solution containing 0.01 to 5 parts by weight of an aromatic polymeric material consisting essentially of at least one polymer selected from the group consisting essentially of soluble aromatic polyimides and aromatic polyamic acids dissolved in a solvent consisting essentially of 100 parts by weight of a base component consisting of at least one organic liquid compound incapable of dissolving therein more than 3% by weight of said aromatic polymeric material in said porous membrane substrate and 0 to 15 parts by weight of an additional component consisting of at least one organic polar liquid compound capable of dissolving therein more than 5% by weight of said aromatic polymeric material and compatible with said base component, to form a coating layer of said dilute dope solution, and

(C) evaporating said solvent from said coating layer of said dope solution.

4,528,005

SMOKESTACK EMISSION CONTROL APPARATUS

William J. Baxter, Box 712, Sebastian, Fla. 32958

Filed Aug. 10, 1984, Ser. No. 639,460

Int. Cl.³ B01D *19/02*

U.S. Cl. 55—178 **10 Claims**

1. A smokestack emission control apparatus comprising in combination:

a housing mounted on top of an emission stack;

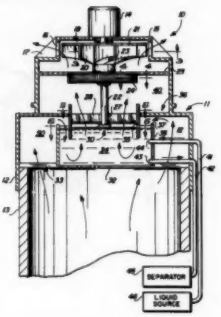
a liquid tank formed in said housing for supporting a liquid therein, said tank mounted in the passageway of escaping emissions from said emission stack;

tank baffle means extending into said liquid tank into a liquid therein to force escaping emissions from said stack therethrough;

a reduced pressure chamber located adjacent to said liquid tank in said housing for drawing said emissions through said liquid in said liquid tank;

means to reduce the pressure in said reduced pressure chamber, said means to reduce the pressure in said reduced pressure chamber including an electric motor driving a plurality of blades mounted adjacent to an exhaust port from said housing;

separator means located remotely from said housing for cleaning liquids passed therethrough;



at least one pipe connecting said liquid tank and separator means for circulating liquid between said liquid tank and separator means;

pump means for circulating liquids from said separator means through said pipes to said liquid tank in said housing;

an anti-foam plate mounted over said liquid tank; and

said electric motor connected to said anti-foam plate for rotating said anti-foam plate to reduce foaming in liquid in said liquid tank, whereby smokestack emissions are passed through a liquid bath for cleaning and cooling said emissions in a liquid at the opening of a smokestack.

4,528,006

APPARATUS FOR THE CONTINUOUS DESUBLIMINATION OF VAPORS OF SUBLIMING SUBSTANCES

Jaroslav Vitovec; Jan Cermak, and Jiri Smolik, all of Prague, Czechoslovakia, assignors to Czechoslovenska akademia ved, Prague, Czechoslovakia

Filed Jul. 22, 1983, Ser. No. 516,298

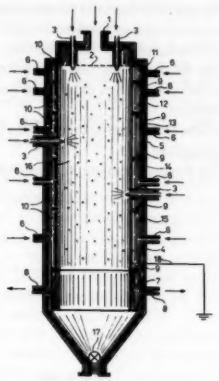
Claims priority, application Czechoslovakia, Jul. 23, 1982, 5614-82

Int. Cl.³ B01D *51/00*

U.S. Cl. 55—269 **2 Claims**

1. In an apparatus for the continuous desublimation of vapors of individual subliming compounds of from mixtures with inert gases by cooling below the desublimation point, said apparatus having a heated jacket with impermeable walls, a gas permeable wall disposed along the inner periphery of the jacket, the external side of said wall together with the inner wall of said jacket enclosing a distribution space provided with inlets of a secondary gaseous medium, the inner side of said gas permeable wall enclosing a desublimation space equipped with an inlet of a vapor-gas mixture and nozzles for the atomization of an evaporable liquid, a separator for the removal of a non-condensed gaseous phase from the product, and a gas outlet, the improvement wherein

a distributor for the vapor-gas mixture is situated between the inlet of said vapor-gas mixture and the desublimation space, the gas permeable wall is electrically conductive and connected with all electrically conductive parts surrounding the desublimation space, the distribution space of the secondary gaseous medium is divided by impermeable partitions into at least three vertically aligned first, second and third sections of the distribution space, disposed respectively increasing distances from the inlet of the vapor-gas mixture, the volumes of said vertically



aligned sections increasing with increasing distances of the sections from said inlet of the vapor-gas mixture, every individual section being provided with a separate inlet of the secondary gaseous medium.

4,528,007

ELEMENT FOR SEPARATING GASEOUS ISOTOPES INTO AT LEAST TWO FRACTIONS AND WITH A SEPARATING BASKET CONSISTING OF SEVERAL SEPARATING ELEMENTS

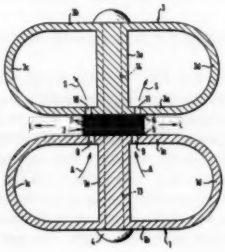
Werner Grossstück, Pforzheim, and Rainer Schäfer, Sprockhövel, both of Fed. Rep. of Germany, assignors to NUSTEP Trenndüsen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG., Essen, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,064 .

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227622

Int. Cl.³ B01D *59/00*

U.S. Cl. 55—395 **13 Claims**



1. Apparatus for separating gaseous isotopes into at least two fractions comprising:

a number of elongated separating nozzle chips having on one side entry openings for introduction of a gas to be processed into said chips, on another side first exit openings for discharging the heavy fraction from said chips and at least at one edge second exit openings for discharge of said light fraction from said chips;

first and second elongated tubular members each having at least one chamber;

said elongated tubular members being disposed on opposite sides of said chips with said chips secured therebetween;

said first elongated tubular member having passageway means connecting its said chambers with said entry openings for introducing said process gas into said chips;

said second elongated tubular member having passageway means connecting its said chambers with said first exit openings for receiving said heavy fraction from said chips;

said chip entry openings extending generally in a longitudinal direction;

said chip first exit openings extending generally in a longitudinal direction; and

connecting means securing said assembly.

4,528,008

DUST COLLECTING FILTER

Shigeru Takagi, and Masahiro Tomita, both of Anjo, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

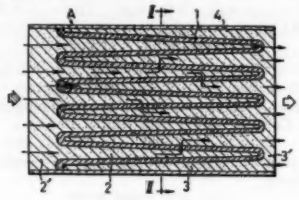
Continuation of Ser. No. 331,063, Dec. 15, 1981, Pat. No. 4,441,899. This application Feb. 17, 1984, Ser. No. 581,174

Claims priority, application Japan, Dec. 30, 1980, 55-187519

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.[3] **B01D** *39/20, 46/52*

U.S. Cl. 55—485 **7 Claims**



1. A filter for collecting dust contained in a flowing fluid, comprising:

a tubular casing for flow therethrough of fluid containing dust;

a thin-walled first filter member snugly disposed within said casing and having a zigzag configuration in a plurality of angularly spaced longitudinal sections defining a plurality of longitudinal flow passages, alternate of said passages being inlet passages having their upstream ends open and their downstream ends closed and the remainder of said passages being outlet passages having their upstream ends closed and their downstream ends open;

a second filter member snugly charged within said inlet passages;

a third filter member snugly charged within said outlet passages; and

a fourth filter member snugly charged within said casing upstream of said second filter member and covering said open ends of said inlet passages and said closed ends of said outlet passages;

all of said filter members having interconnecting pores, the pores of said second and third filter members being larger than the pores of said first filter member and the pores of said fourth filter member being larger than those of said first filter member and smaller than those of said second filter member.

4,528,009

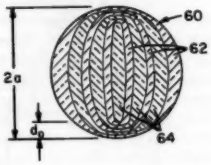
METHOD OF FORMING OPTICAL FIBER HAVING LAMINATED CORE

Arnab Sarkar, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 1, 1983, Ser. No. 500,004

Int. Cl.[3] **C03B** *37/01*

U.S. Cl. 65—3.12 **3 Claims**



1. In the method of manufacturing an optical fiber preform which includes the steps of

passing through a rotating substrate tube a vapor mixture which, when heated, forms glass particles,

moving a heat source along the outside of said tube whereby at least a portion of said vapor mixture is converted to glass particles and at least a portion of said glass particles is deposited on the inside of said tube, and

collapsing the resultant structure to form an aperture-free optical fiber preform,

the improvement which comprises halting rotation of said tube,

nonuniformly heating said stationary tube to a first temperature which is lower than that which causes substantial deformation thereof but sufficiently high to generate within said tube at least one longitudinal region of sufficiently high temperature to cause the reaction of a first vapor mixture and the generation of glass particles only adjacent that portion of said tube that is being heated, at least a first deposit of particles thereby forming along said at least one longitudinal region,

rotating said substrate tube,

stopping the flow of vapor mixture,

heating said rotating substrate tube to a second temperature which is high enough to sinter said glass particles and form at least one longitudinal glassy strip within said tube,

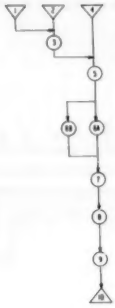
continuing the steps of halting rotation, nonuniformly heating, rotating, stopping the flow, and heating to thereby build up on opposite sides of the inner surface of said substrate tube a plurality of glassy strips, the composition of said vapor mixture being different during the deposition of adjacent glassy strips whereby the refractive index of each glassy strip differs from that of the adjacent glassy strip, the composite thicknesses of all of said oppositely disposed strips being greater at said opposite sides of said tube to which said strips are applied than at regions of said strips that are orthogonal to said opposite sides, and

applying to those diametrically opposed regions of said substrate upon which said glassy strips have been formed a sufficient amount of heat to cause said substrate tube to collapse flat and form an elliptically-shaped preform in which said glassy strips form substantially parallel layers.

4,528,010
PROCESS FOR PRODUCING OPTICAL GLASS PRODUCT

Takao Edahiro; Nobuo Inagaki, both of Ibaraki, and Shiro Kurosaki, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Sumitomo Electric Industries, both of, Japan

Continuation of Ser. No. 295,965, Aug. 25, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 584,968
Claims priority, application Japan, Aug. 25, 1980, 55-117524
Int. Cl.[3] C03B *19/06*
U.S. Cl. 65—18.1 8 Claims



1. A process for producing an optical glass product having a predetermined distribution of refractive index in the interior of the product, said process comprising the steps of:

(a) mixing together a silica compound with a silicate selected from the group consisting of rubidium silicate, thallium silicate and cesium silicate, and thereby preparing an aqueous silicate solution containing from about 0.1 to about 0.6 mol/liter of Si, as SiO_2, said solution comprising silicic acid and at least one element selected from the group consisting of rubidium, thallium and cesium;

(b) mixing the silicate solution with an acidic aqueous solution of dilute acetic acid, dilute H_2SO_4, H_3BO_3, H_3PO_4, $Al_2(SO_4)_3$ or HCl to produce a reaction mixture having a pH of about 6.3 when HCl is used or a pH of about 4.4 when acetic acid, H_2SO_4, H_3BO_3, H_3PO_4 or $Al_2(SO_4)$ is used, and allowing the reaction mixture to react for a period of time sufficient for polymerization to produce a completely gelled porous product wherein the silica particles of said product are agglomerated;

(c) leaching the gelled product with a liquid capable of dissolving Rb_2O, Cs_2O or Tl_2O, said liquid being selected from the group consisting of (i) water, (ii) a weakly acidic aqueous solution, (iii) an aqueous solution having an alkali metal salt dissolved therein, and (iv) an aqueous solution of organic matter or (v) a mixture of any two of (i) to (iv), said leaching being continued until the concentration of at least one compound selected from the group consisting of Tl_2O, Rb_2O and Cs_2O parabolically decreases from the center of said gelled product outward; and

(d) drying the leached product in a predetermined atmosphere, and further heating the partially leached gelled product at a temperature sufficiently high to eliminate the particulate material but lower than the melting point of the silica, whereby the micropores in the leached product are caused to collapse.

4,528,011
IMMOBILIZATION OF RADWASTES IN GLASS CONTAINERS AND PRODUCTS FORMED THEREBY

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Catherine J. Simmons, Bethesda, Md.; Danh C. Tran, Rockville, Md.; Nicholas Lagakos, Silver Spring, Md., and Joseph Simmons, Bethesda, Md., assignors to Pedro B. Macedo, Bethesda and Theodore A. Litovitz, Annapolis, both of, Md.

Division of Ser. No. 034,567, Apr. 30, 1979, Pat. No. 4,312,774, which is a continuation-in-part of Ser. No. 959,220, Nov. 9, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,336
Int. Cl.[3] C01C *21/00*
U.S. Cl. 65—30.13 11 Claims

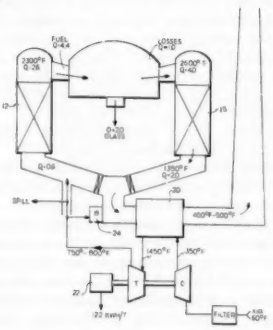
1. Method of making a glass article starting with a porous glass preform comprising immersing said preform in a solution having a pH between 9 and 13.5 comprising ammonium hydroxide and at least one dopant selected from the group consisting of cesium, rubidium, strontium, and copper, and drying and heating to collapse the pores of the preform to form a highly durable glass article comprising more than 86 mole % SiO_2 and between 0.5 and 6 mole % dopant oxide.

7. A method of varying the thermal expansion coefficient of a glass container to make it suitable for use in the storage of radioactive nuclear waste by introducing and varying a dopant concentration in its structure which comprises impregnating a hollow porous borosilicate glass container with a liquid solution of dopant having a pH of between 9 and 13.5, said glass container being characterized by an interconnecting porous structure and ≡SiOH groups on its surface, causing the cation moiety of said dopant to undergo ion exchange with the proton of the ≡SiOH group, removing liquid from said glass container and collapsing its porous structure while maintaining the shape of the container.

4,528,012
COGENERATION FROM GLASS FURNACE WASTE HEAT RECOVERY

Dennis T. Sturgill, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 30, 1984, Ser. No. 574,812
Int. Cl.[3] C03B *5/16*
U.S. Cl. 65—135 10 Claims



1. The method of operating a glass melting furnace with recovery of a portion of the heat being exhausted from the melter comprising the steps of firing the melter with a plurality of burners through one or more burner ports, one or more exhaust ports positioned to receive the exhaust from said melter, passing the exhaust from said melter through a (primary) regenerator to store heat therein, flowing the exhaust gases at about 1350° F. from the regenerator through the primary path of an indirect heat exchanger, adding additional heat to the gases entering the heat exchanger to raise the temperature thereof to about 1600° F. by use of a supplementary

burner, passing the spent gases from the heat exchanger to an exhaust stack at a temperature in the range of 450°-500° F., compressing ambient air to about 100 psig, passing the compressed air through the secondary path of the heat exchanger to raise the temperature of the compressed air to about 1450° F., expanding the heated, compressed air in a turbine that is also coupled to the compressor and an electrical generator, exhausting clean air from the turbine at a temperature above 750° F. and atmospheric pressure, using a portion of the exhausted air as the preheated air for the supplementary burner, passing the balance of the exhaust air from the turbine into a heat storage regenerator to raise the temperature of the air to about 2300° F., using this preheated clean air as the combustion air for firing the melter, and reversing the cycle by reversing the firing side and exhaust side of the melter at regular intervals while recovering a portion of the waste heat in the form of electrical energy.

4,528,013

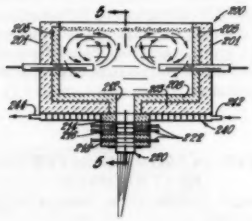
MELTING FURNACES

Charles S. Dunn, Pataskala; Mark A. Propster, and Charles M. Hohman, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 405,851, Aug. 6, 1982, abandoned. This application Jul. 11, 1983, Ser. No. 512,067

Int. Cl.³ C03B *5/033*

U.S. Cl. 65—136 **10 Claims**



1. In a method of melting glass in a melting furnace confining a pool of molten glass above a furnace bottom wall and having means for depositing a layer of unmelted particulate glass batch on the surface of the pool and also having heating electrodes immersed in the pool of molten glass and located at a vertically medial portion of said pool, the steps of:

a. heating the pool of molten glass by said electrodes to form an isothermal layer of molten glass;

b. circulating heated glass upwardly from the electrode location to melt the batch layer;

c. returning most of the glass back to the electrode location for reheating while flowing a portion of the glass downwardly beyond the electrode location;

d. that glass located beneath the electrodes flowing downwardly in said pool and through a vertical outlet passage directly into a forming apparatus underlying the pool as glass is withdrawn through said forming apparatus; and

e. flowing a heat exchange medium through a heat exchanger located above the forming apparatus in heat exchange relation (a) with the furnace bottom wall and (b) with the downwardly flowing glass in said outlet passage in a manner to cool the molten glass in successive, essentially isothermal layers, the glass issuing from said passage being at a substantially uniform temperature which is conducive to forming in said forming apparatus.

4. A glass melting furnace for supplying molten glass to a fiberizing bushing comprising a refractory enclosure for a pool of molten glass overlying a central outlet passage directly vertically communicating with and fully opening into the bushing, heating electrodes immersed in the pool of molten glass, and fluid-cooled heat exchange means immersed in the molten glass in said passage to cool the glass in successive substantially isothermal planes to a temperature conducive to fiberization as it flows downwardly through said passage into said bushing.

4,528,014

DEVICE FOR THE PRODUCTION OF GLASS DROPS FROM A GLASS MELT CONTAINING RADIOACTIVE WASTE

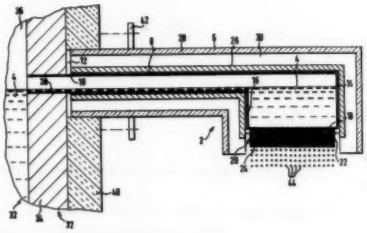
Wilfried C. Heimerl, Mol, Belgium, assignor to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,324

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145785

Int. Cl.³ C03B *19/10*

U.S. Cl. 65—142 **9 Claims**



1. A device for producing glass drops from a glass melt containing radioactive waste comprising

(a) a melting furnace having an opening in the sidewall thereof at the intended melt level;

(b) a horizontal overflow tube at one end connecting to said opening, and at the other end terminating in a vertically-disposed downspout, said tube being sealed around said opening

said downspout having a bottom closure; and

(c) a plurality of drip nozzles mounted in said bottom closure for dispensing drops of glass from said tube, the distance between said nozzles being sufficient to prevent coalescence of said drops

said nozzles providing the only outlets from said overflow tube.

4,528,015

GLASS FORMING BLANK AND PLUNGER COOLING

Vaughan Abbott, North Granby; Nicholas G. Morris, Windsor; Scott M. Lambert, Enfield, and Richard A. Letellier, East Windsor, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

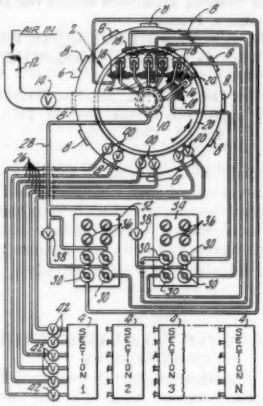
Filed Mar. 4, 1983, Ser. No. 472,297

Int. Cl.³ C03B *9/38*

U.S. Cl. 65—162 **4 Claims**

1. A cooling air system for use with a glassware forming machine having a plurality of individual forming units, each having a plurality of different mechanisms to be cooled, each forming unit having the same mechanisms as the others, said system comprising a manifold associated with each mechanism, an inlet line connecting each manifold to a source of cooling air, a pilot operated pressure regulator in each inlet

line, means connecting each manifold to its associated mechanism in all forming units, and manually operated means associated with each of said pressure regulator for individually controlling the flow of pilot air to each pressure regulator.

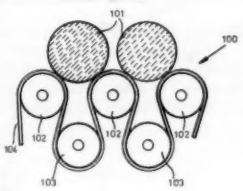


4,528,016

GLASS SHEET TREATING FURNACE WITH A ROLLER CONVEYOR

Douglas M. Canfield, Suffern, N.Y., and Casso-Solar Corporation, 02, Allendale, N.J.

Filed Sep. 12, 1983, Ser. No. 531,906
Int. Cl.³ C03B 27/00
U.S. Cl. 65—163 **9 Claims**



1. A furnace for the heat treatment of glass including annealing, heat-strengthening, tempering and bending of glass which comprises:

a housing defining an elongated furnace chamber having an inlet and an outlet;

a roller conveyor between said inlet and said outlet and including two rows of stub rollers disposed along each side of said housing flanking a path between said inlet and said outlet including an upper row and a lower row with the stub rollers of the upper row being located between stub rollers of the lower row, a drive conveyor belt looped over each stub roller of each upper row and under a stub roller of the respective lower row therebetween on one side of said conveyor, and fused silica support rollers spanning said conveyor with each support resting upon two stub rollers of said upper row overshot by said belt;

means for driving said belt to oscillate glass objects carried by said support rollers back and forth in said housing; and

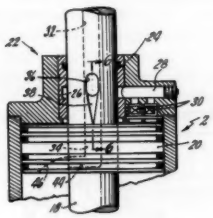
an array of infrared heaters mounted in said housing above said conveyor.

4,528,017

BLANK CYLINDER APPARATUS

Vaughan Abbott, North Granby; Bruce R. Beckwith, Unionville; Charles M. Kingsbury, Manchester; John P. Mungovan, Simsbury, all of Conn., and Elden H. Mills, Windham, Vt., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 4, 1983, Ser. No. 472,365
Int. Cl.³ C03B 9/40
U.S. Cl. 65—240 **3 Claims**



1. In a glassware forming machine, a blank cylinder mechanism for moving at least one blank mold connected thereto, said mechanism comprising a piston rod, a piston member mounted on said piston rod, a cylinder mounted on said piston member and moveable with respect thereto, a cam follower arm extending outwardly from said cylinder terminating in a cam follower, a cam track plate having a cam track therein, said cam follower being positioned in said cam track, an air conduit in said piston rod including an outlet port, said cylinder having a head portion having a chamber therein which communicates with the outlet port when said piston is adjacent said head portion, a passageway in said head portion extending from said chamber to said interior of the cylinder, check valve means in said passageway, said check valve means permitting air to flow from said chamber to the interior of said cylinder, but preventing flow from the interior through said passage to the chamber, and a double tapered slot in said piston rod extending from said exit port to said piston, said slot having its deepest position adjacent said outlet port.

2. In a glassware forming machine, a blank cylinder mechanism for moving at least one blank mold connected thereto, said mechanism comprising a support member, a piston rod mounted on said support member, a piston mounted on said piston rod, a cylinder mounted on said piston member and movable with respect thereto, an arcuate cam track plate mounted on said support member and having a cam track therein, a cam follower arm extending from said cylinder and terminating in a cam follower positioned in said cam track, said cam track having an upper portion which is substantially vertical and a lower portion connected to said upper portion which imparts rotation to the cylinder as the cylinder moves vertically, a bottom plate mounted on said support member about said piston rod to form a stop for the downward movement of said cylinder, and at least one removable shim member positioned between said bottom plate and said support member, said shim in combination with the cam track and cam follower causing said cylinder rotate about its vertical axis when a shim is added or withdrawn.

4,528,018
TRANSFER STATION FOR A GLASS-FORMING MACHINE

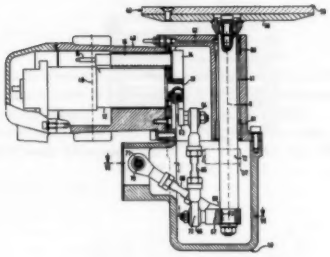
Wilhelm Schneider, Auetal, and Hans-Georg Seidel, Rinteln, both of Fed. Rep. of Germany, assignors to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Continuation of Ser. No. 367,968, Apr. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 260,285, May 4, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 564,344

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018232

Int. Cl.[3] **C03B** *35/00*; **B65G** *47/14*

U.S. Cl. 65—260 **3 Claims**



1. A transfer station in combination with a glass-forming machine having a discharging station and with a conveyor for glass articles, which conveyor is laterally offset relative to said discharging station, and which transfer station transfers onto said conveyor a plurality of glass articles discharged at said discharging station from the glass-forming machine, said transfer station comprising a depositing plate for simultaneously receiving said plurality of glass articles discharged at said discharging station; a vertical shaft connected at one end thereof to the depositing plate; a housing supporting the shaft for rotation about a vertical axis and guiding the shaft for movement along the vertical axis; a drive unit including a drive motor having an output shaft; coupling means for coupling the output shaft with the vertical shaft (1) to move the depositing plate along the vertical axis between a raised receiving position at said discharging station and a lowered transferring position at said conveyor and (2) to rotate the depositing plate about the vertical axis between a receiving angular position at said discharging station and a transferring angular position at said conveyor; means for simultaneously transferring said plurality of glass articles from the depositing plate to said conveyor when the depositing plate is in said transferring position; said coupling means including a crank fixed to the output shaft to rotate in a plane which extends substantially parallel to said vertical axis, a connecting member fixed to said vertical shaft, at a location below said crank, a connecting rod, a first universal joint connecting one end of said connecting rod to said crank, a second universal joint connecting the other end of said connecting rod to said connecting member, a guide rod, a third universal joint connecting one end of said guide rod to said connecting member, and a fourth universal joint connecting the other end of said guide rod to said housing, said third universal joint having a center which is located outside of another plane including the center of said second universal joint and the longitudinal axis of said vertical shaft.

4,528,019
NATURAL ORGANIC SUBSTANCE FOR REGENERATING LIGNOUS VEGETABLES

Gilbert Jean, and Maurice Jean, both of 100 rue Desmoulins, Batiment A, Valence, France

PCT No. PCT/FR82/00207, § 371 Date Aug. 15, 1983, § 102(e) Date Aug. 15, 1983, PCT Pub. No. WO83/02112, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 10, 1982, Ser. No. 531,047

Claims priority, application France, Dec. 15, 1981, 81 23549

Int. Cl.[3] **C05F** *3/00*

U.S. Cl. 71—15 **5 Claims**

1. A natural organic substance which is applied to vegetation to assist in regeneration of said vegetation, said substance comprising old, cool manure mixed with fresh animal excrement, said old, cool manure having already completed its fermentation, said manure and excrement mixture being moist and being positioned within an air-tight chamber.

4,528,020
UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

Jaroslav F. Kolc, Randolph; Michael D. Swerdloff, Parsippany; Milorad M. Rogic, Whippany, all of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 16, 1983, Ser. No. 505,016

Int. Cl.[3] **C05C** *9/00*

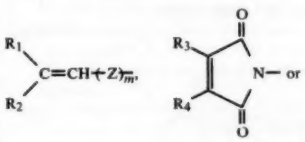
U.S. Cl. 71—28 **27 Claims**

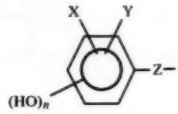
1. A urease inhibiting composition comprising an acceptable carrier and a urease inhibiting effective amount of one or more compounds of the formula:

A—R—B

wherein:

"A" is a moiety of the formula:





wherein:

n is 1 or 2;

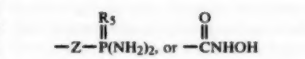
m is 0 or 1;

R_1 and R_2 are the same and different and are trihalomethyl, cyano, alkylsulfonyl, arylsulfonyl, halogen, nitro, alkoxycarbonyl, arylcarbonyl, or alkylcarbonyl;

R_3 and R_4 are the same are different and are R_1, R_2 or hydrogen;

X and Y are the same or different and are hydrogen, alkyl, alkoxy, amino, nitro, isocyano, cyano, isocyanato, mercapto, alkylmercapto, phenyl or phenoxy, or X and Y together may form an alkylene or a alkenylene chain completing a 3, 4, 5 or 6 membered aliphatic or aromatic ring structure; and

B is a moiety of the formula:

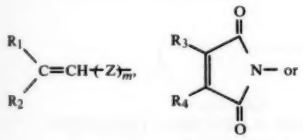


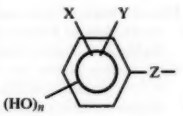
wherein:
R_5 is oxygen or sulfur;
Z is the same or different at each occurrence and is a divalent oxygen, sulfur, nitrogen, sulfinyl or sulfonyl group; and
R is alkylene, alkenylene, cycloalkylene, arylene, cycloalkenylene, bicycloalkylene, or bicycloalkenylene groups, which groups may optionally include one or more divalent carbonyl, oxygen, sulfur or nitrogen groups.

23. An improved fertilizer composition which comprises urea and/or one or more urea precursor compounds capable of forming urea in situ when subjected to the use conditions of the composition, and a urease inhibiting effective amount of one or more compounds of the formula:

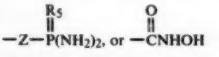
A—R—B

wherein:
"A" is a moiety of the formula:





wherein:
n is 1 or 2;
m is 0 or 1;
R_1 and R_2 are the same and different and are trihalomethyl, cyano, alkylsulfonyl, arylsulfonyl halogen, nitro, alkoxycarbonyl, arylcarbonyl, alkylcarbonyl;
R_3 and R_4 are the same are different and are R_1, R_2 or hydrogen;
X and Y are the same or different and are hydrogen, alkyl, alkoxy, amino, nitro, isocyano, cyano, isocyanato, mercapto, alkylmercapto, phenyl, or phenoxy, X and Y together may form an alkylene or alkenylene chain completing a 5 or 6 membered aliphatic or aromatic ring structure;
B is a moiety of the formula:



wherein:
Z is the same or different at each occurrence and is a divalent oxygen, sulfur, nitrogen, sulfinyl or sulfonyl group; and
R is alkylene, alkenylene, cycloalkylene, arylene, cycloalkenylene, bicycloalkylene, or bicycloalkenylene groups, which groups may optionally include one or more divalent carbonyl, oxygen, sulfur or nitrogen groups.

4,528,021

GRANULATED FERTILIZER AND SLURRY PROCESS THEREFOR

John L. Medbery, Doraville, Ga., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 15, 1983, Ser. No. 561,763
Int. Cl.³ C05B *1/02*
U.S. Cl. 71—41 **13 Claims**

1. A continuous slurry process for the production of granulated fertilizers comprising the steps of
(a) continuously introducing into a pre-reactor (i) phosphate rock containing 66–75% tricalcium phosphate comminuted to a size such that 90% passes a 100-mesh screen and 70–80% passes a 200-mesh screen, (ii) phosphoric acid containing 38–54% P_2O_5 in an amount sufficient to provide a ratio of P_2O_5 to CaO in the reaction mixture of 0.7 to 1.0, and (iii) water in an amount sufficient to dilute the phosphoric acid to 38–44% P_2O_5,
(b) heating the mixture with agitation to 175°–220° F., and
(c) continuously transferring the mixture to a digester having a volume sufficient to provide a retention of 60 to 90 minutes,
(d) heating the mixture with agitation to a temperature of 200°–225° F. for a retention time of 60 to 90 minutes, thereby forming a slurry while
(e) continuously withdrawing slurry
(f) splitting the slurry into two streams
(g) recycling one stream to the pre-reactor, and
(h) delivering the other stream to a granulator and mixing with other dry fertilizer ingredients, thereby producing fertilizer granules, and
(i) drying the granules.

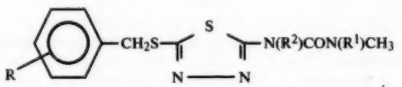
4,528,022

DEFOLIATING COMPOSITION

Allen R. Blem, Cheshire, and James A. McGuinness, Naugatuck, both of Conn., assignors to Uniroyal, Inc., Middlebury, CT

Filed Nov. 15, 1983, Ser. No. 552,239
Int. Cl.³ A01N *47/36*; C07D *285/12*
U.S. Cl. 71—73 **6 Claims**

1. A defoliating composition comprising a compound having the structural formula



wherein R is F, Cl, 3-Br, 4-Br, I, CN or CX_3, where X is F, Cl or Br; R^1 is hydrogen or C_1–C_4 alkyl, and R^2 is C_1–C_4 alkyl; and a carrier for said compound.

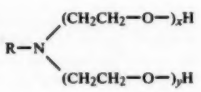
4,528,023

ENHANCEMENT OF HERBICIDAL ACTIVITY OF TETRAALUMINUM SALTS OF N-PHOSPHONOMETHYLGLYCINE

James L. Ahle, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 25, 1983, Ser. No. 517,147
Int. Cl.³ A01N *25/30*
U.S. Cl. 71—86 **8 Claims**

1. A herbicidal composition comprising
(a) a herbicidally effective amount of a tetraaluminum salt of N-phosphonomethylglycine; and
(b) from 0.5 to 50% by weight polyethoxylated amine surfactant of the formula



where R is tallow oil having an average of 18 carbon atoms and x+y total 15.

4,528,024

HERBICIDAL ALKYL SULFONES

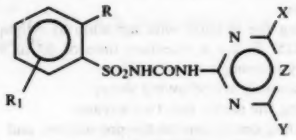
Gerald E. Lepone, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 300,501, Sep. 9, 1981, abandoned. This application Jul. 16, 1982, Ser. No. 397,655

Int. Cl.[3] **A01N** *47/36;* **C07D** *239/42*

U.S. Cl. 71—92 **14 Claims**

1. A compound of the formula



wherein

R is $S(O)_nCH(R_2)A$;

A is $OCH_2CH_2OCH_3$, $CH_2OCH_2CH_2OCH_3$, CO_2R_3, $CH_2CO_2R_3$; CN, CH_2CH_2CN,

CH_2OH, $CH(OH)CH_3$, CH_2CH_2OH, $C(O)CH_3$, $CH_2C(O)CH_3$, CHO, $CH(OCH_3)_2$ or

R_1 and R_4 are independently H, F, Cl, Br, CH_3, OCH_3, CF_3 or NO_2;

R_2 is H or CH_3;

R_3 is C_1-C_2 alkyl;

n is 0, 1 or 2;

p is 0, 1 or 2;

X is CH_3, OCH_3 or Cl;

Y is CH_3, C_2H_5, CH_2OCH_3, OCH_3, OC_2H_5, NH_2, $NHCH_3$ or $N(CH_3)_2$; and

Z is CH;

and their agriculturally suitable salts.

4,528,025

HERBICIDALLY ACTIVE QUINOLINE OR QUINOXALINE ACETOPHENONE OXIME DERIVATIVES

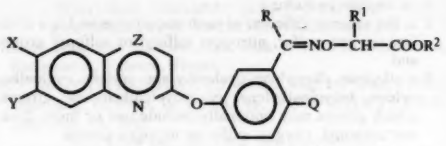
Dennis K. Krass, Canal Fulton, and Sidney B. Richter, Fairlawn, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 436,223, Oct. 25, 1982, Pat. No. 4,440,930. This application Dec. 8, 1983, Ser. No. 559,598

Int. Cl.[3] **C07D** *215/22, 241/44;* **A01N** *43/60, 43/42*

U.S. Cl. 71—92 **2 Claims**

1. In a method of controlling weed growth wherein a herbicidally effective amount of herbicide is applied either to the growth medium prior to emergence of the weeds therefrom or to the weeds subsequent to their emergence from the growth the medium wherein the improvement resides in using as the herbicide a compound or mixture of compounds of the formula:



wherein:

R is hydrogen or alkyl of up to 3 carbon atoms which alkyl may be substituted by halogen, cyano, alkoxy or alkylthio;

R^1 is hydrogen or methyl,

R^2 is hydrogen, alkyl of up to 10 carbon atoms or an agronomically suitable ionic species;

Q halogen, nitro, or cyano,

X and Y are the same or different and represent hydrogen, halogen, alkyl or haloalkyl of up to 4 carbon atoms, and

Z is nitrogen.

4,528,026

2-(OR4-)AMINO-5-ALKYLTHIO-PYRIMIDINE HERBICIDES

Daniel Balde, Paris, and Gerard E. M. Boutemy, Milly La Foret, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

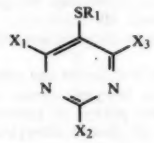
Continuation of Ser. No. 926,999, Jul. 21, 1978, abandoned. This application Sep. 30, 1980, Ser. No. 192,564

Claims priority, application France, Jul. 28, 1977, 7723222; Feb. 15, 1978, 7804207

Int. Cl.[3] **A01N** *9/22;* **C07D** *239/30, 239/38, 239/48*

U.S. Cl. 71—92 **16 Claims**

1. Pyrimidine compounds of the formula:



(I)

in which R_1 is alkyl having 1 to 5 carbon atoms, X_1 is chlorine or bromine, X_2 is

in which R_2 is hydrogen or alkyl having 1 to 5 carbon atoms, and R_3 is hydrogen, alkyl having 1 to 5 carbon atoms or

R wherein R is hydrogen or alkyl having 1 to 5 carbon atoms, and X_3 is

in which R_4 is hydrogen and R_5 is hydrogen or

R wherein R is as defined above, or their salts with mineral or organic acids.

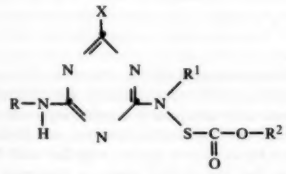
4,528,027

ACYLTHIO-SUBSTITUTED TRIAZINES

William W. John; Kurt H. Pilgram, both of Modesto, and Mae E. F. Martin, Manteca, all of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed May 24, 1984, Ser. No. 613,495
Int. Cl.[3] C07D *251/50, 251/52;* **A01N** *43/70*
U.S. Cl. 71—93 **3 Claims**

1. A compound of the formula:



(I)

wherein X is middle halogen, alkoxy or alkylthio of one to three carbon atoms, R is alkyl of two to four carbon atoms, cycloalkyl of three to four carbon atoms, or 1-cyanoalkyl of three to five carbon atoms; R^1 is alkyl of one to four carbon atoms or cyclopropyl; R^2 is alkyl of from one to eight carbon atoms.

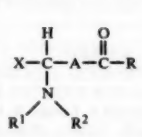
4,528,028

USE OF CERTAIN HALOGEN-CONTAINING AMINO-ACID COMPOUNDS FOR CONTROLLING THE GROWTH OF UNWANTED PLANTS

Dennis H. Flint, 1316 Amy Ave., Modesto, Calif. 95355, and Richard B. Silverman, 2921 W. Chase Ave., Chicago, Ill. 60645

Filed Sep. 15, 1983, Ser. No. 532,414
Int. Cl.[3] A01N *37/02, 37/06, 37/18*
U.S. Cl. 71—113 **2 Claims**

1. A method for controlling the growth of unwanted plants at a locus which comprises applying to the locus an effective amount of a compound of the formula:



(I)

wherein X is (halogen)CH_2—, (halogen)$_2$CH—, or (halogen)$_3$C—; A is —CH_2—CH_2— or —CH=CH—; R is —OH, —OR^3, —NH_2 or —NHR^3, wherein R^3 is alkyl of one to six carbon atoms; R^1 is hydrogen, R^2 is hydrogen, —C(O)R^4, —C(O)OR^4 or —C(O)—CH_2—OR^5 wherein R^4 is alkyl of one to six carbon atoms optionally substituted by halogen, or is phenyl or benzyl optionally substituted by from one to three of one or more of halogen, nitro, hydroxyl and alkyl, alkoxy and alkylthio of from one to four carbon atoms, and R^5 is one of the phenyl moieties represented by R^4, or R^1 and R^2 together represent an alkylidene moiety

wherein R^6 is hydrogen and R^7 is a moiety represented by R^4, or R^6 and R^7 each is alkyl of from one to four carbon atoms, or is one of the phenyl moieties represented by R^4.

4,528,029

SELF-REDUCING IRON OXIDE AGGLOMERATES

Mehmet A. Goksel, Houghton, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Continuation of Ser. No. 170,643, Jul. 21, 1980, abandoned. This application Feb. 16, 1983, Ser. No. 580,828
Int. Cl.[3] C22B *1/14*
U.S. Cl. 75—3 **8 Claims**

1. A process for producing self-reducing agglomerates from a finely-divided, iron ore concentrate and having a compressive strength of at least 100 lbs. comprising the consecutive steps of:

(a) preparing a moistened starting mixture including the iron ore concentrate, a finely-divided natural or pyrolyzed carbonaceous material having a volatile matter (on dry basis) content of about 20 weight % or less in an amount at least sufficient to reduce all the iron oxide to metallic iron, about 1 to about 30 weight % of a finely-divided bonding agent selected from a group consisting of the oxide, hydroxides, and carbonates of calcium and magnesium, and mixtures thereof, and 0 up to about 3 weight % of a finely-divided siliceous material, as available SiO_2 capable of reacting with said bonding agent to form silicate or hydrosilicate bonds therwith with the total available SiO_2 in said mixture being at least 0.5 weight % the weight percentages based upon the total weight of the dry solids in said mixtures;

(b) allowing said mixture to stand for about 0.5 to about 48 hours at a temperature of about 60° to about 90° C. to promote the migration of a substantial portion of the free internal moisture in the pores of said carbonaceous material to the surface of said carbonaceous material;

(c) forming discrete, green agglomerates from said starting mixture;

(d) drying said green agglomerates to a moisture content of about 5 weight % or less; and

(e) hydrothermally hardening said green aglomerates by contacting them with steam at a temperature of about 100° to 250° C. for a time period sufficient for said bonding agent to form silicate or hydrosilicate bonds with the available SiO_2 and produce hardened and integrally bonded masses.

4,528,030

METHOD OF REDUCING IRON ORE

Enrique R. Martinez Vera, Monterrey, and Jorge O. Becerra-Novoa, Apodaca, both of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed May 16, 1983, Ser. No. 494,629
Int. Cl.[3] C21B *13/02*
U.S. Cl. 75—35 **23 Claims**

1. A method of reducing particulate iron ore in a vertical shaft, moving bed reactor by a reducing gas formed therein from make-up gases mainly composed of gaseous hydrocarbon and steam, with said reactor having a reduction zone in which said ore is reduced to sponge iron, which comprises:

feeding to said reduction zone hot recycle gas and make-up gases largely comprised of hydrogen, carbon monoxide, gaseous hydrocarbon, and steam,

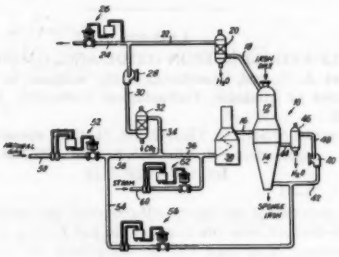
causing said gases to flow through at least a portion of said

bed to effect reduction of the ore therein and to effect reformation of gaseous hydrocarbon with steam therein to yield a resulting off-gas,

essentially all said hydrogen and carbon monoxide being derived by said reformation within said reactor,

withdrawing the off-gas from said reduction zone,

de-watering and removing carbon dioxide from such off-gas to yield a resulting upgraded gas,



re-heating the upgraded gas and returning such upgraded gas as the recycle gas to said reduction zone thereby forming a reducing gas recirculation loop, and

feeding make-up gases substantially comprised of steam and gaseous hydrocarbon to said upgraded recycle gas in said loop.

4,528,031

FLOW PROMOTOR FOR PARTICULATE MATERIAL

Ararat Hacetoglu, St. Catharines, and William K. Kodatsky, Welland, both of Canada, assignors to Cyanamid Canada, Inc., Ontario, Canada

Filed Jun. 15, 1984, Ser. No. 621,009

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—53 **10 Claims**

1. A composition having improved flow characteristics which comprises a particulate carbide-based desulfurizing reagent in admixture with an organic, polar liquid which promotes flow of, and is inert with respect to, the desulfurizing reagent.

4,528,032

LITHIUM PURIFICATION TECHNIQUE

Robert F. Keough, and George E. Meadows, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 10, 1984, Ser. No. 569,698

Int. Cl.³ C22B *26/10*

U.S. Cl. 75—66 **5 Claims**

1. A method for purification of liquid lithium by precipitation of aluminum nitride formed from an unwanted quantity of an impurity in the form of either aluminum or nitrogen present in the liquid lithium, comprising the following steps:

adding a reagent to the liquid lithium in the form of a stoichiometric quantity of either nitrogen or aluminum to react with the unwanted quantity of impurity in the form of either aluminum or nitrogen, respectively, to form insoluble aluminum nitride;

permitting the reaction to continue until completed; and

separating the resulting precipitate of aluminum nitride from the liquid lithium.

4,528,033

METHOD FOR PRODUCING BLISTER COPPER

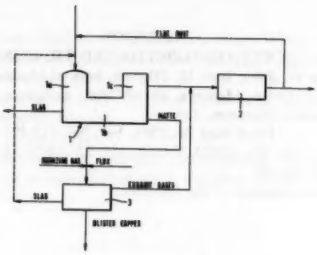
Bengt T. Andersson, Espoo, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Jun. 14, 1984, Ser. No. 620,442

Claims priority, application Finland, Jun. 15, 1983, 832170

Int. Cl.³ C22B *15/00*

U.S. Cl. 75—73 **4 Claims**



1. A method for producing blister copper so that smelting and then converting of the raw material are carried out in separate treatment units comprising conducting molten matte from a smelter unit into a converter reaction, and feeding said molten matte into the converter reactor together with flux and oxidizing gas so that the molten matte is dispersed by the oxidizing gas into tiny molten particles.

4,528,034

SELENIUM-CONTAINING AMALGAM ALLOYS FOR DENTAL RESTORATION AND METHOD FOR THE PREPARATION THEREOF

Atsushige Sato; Ishi Miura; Yasuhiro Kumei, all of Tokyo; Osamu Okuno, Narashino; Tsuyoshi Nakano, Chiba, and Bunsaku Yoshida, Warabi, all of Japan, assignors to Atsushige Sato; Ishi Miura and G-C Dental Industrial Corp., all of Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,498

Claims priority, application Japan, Apr. 2, 1982, 57-53681

Int. Cl.³ C22C *5/08*

U.S. Cl. 75—255 **4 Claims**

1. Selenium-containing amalgam alloys for dental restoration comprising 0.1–50% by weight of a copper alloy powder containing no less than 50% by weight of copper and 0.01–5% by weight of selenium, mixed with 50–99.9% by weight of a silver-tin-copper amalgam alloy powder.

4,528,035

COMPOSITION AND PROCESS TO CREATE FOAMING SLAG COVER FOR MOLTEN STEEL

William B. Simpson, Jr.; David F. Lundy; R. L. Parnell; Charles W. Snodgrass; Edward B. Miller, all of Sand Springs, and John M. Harvey, Tulsa, all of Okla., assignors to Metro Materials Corporation, Tulsa, Okla.

Filed May 21, 1984, Ser. No. 612,403

Int. Cl.³ C22B *9/10*

U.S. Cl. 75—257 **14 Claims**

1. A method of foaming the slag generated in a steel making electric arc furnace after melt-down of steel raw material comprising the steps of:

when the amount of said slag atop said melted steel is at least 4 inches deep, introducing a foaming agent into the furnace slag, the composition of said agent comprising essentially calcium oxide (CaO) and free carbon (C) particles.

4,528,036

PROCESS FOR PREPARING PRINTING INK BINDERS, AND THEIR USE IN PRINTING INKS

Albert Rudolphy, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 377,909, May 13, 1982, abandoned. This application Mar. 29, 1984, Ser. No. 594,699

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119637

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—30 **9 Claims**

1. A process for preparing printing ink binders which consists essentially of (A) reacting a natural resin acid (a) with (B) a copolymer (b+c) which has an acid number of 35 to 100 and is derived from (b) polymerizable hydrocarbons having isolated C_5 rings and (c) an α,β-olefinically unsaturated carboxylic acid component, the natural resin acid (a) and the copolymer (b+c) being in a weight ratio of (1 to 5):1, to yield a product having an acid number of 75 to 150, which is then (C) reacted with a metal compound (d) selected from the group consisting of at least one calcium compound, and a combination thereof with a compound at least one other metal of group II of the periodic system, in an amount of 1.5 to 6% by weight of metal content, relative to the total amount of components (a) to (c), in such a way that the acid number is reduced by at least one third of its value and, after the reaction of the metal compounds, converting not yet converted metal compounds via acetates, into salts of the resin by treatment with acetic acid.

4,528,037

METHOD OF MANUFACTURING HEAT INSULATING AGGREGATES OR PELLETS AND PRODUCT THUS OBTAINED

Gilbert R. Guidat, 14, rue Jean Bioletti, Saint Laurent FR 83000 - Epinal, France

Continuation-in-part of Ser. No. 438,852, filed as PCT FR 82/00027, Feb. 12, 1982, published as WO82/02710 Aug. 19, 1982, § 102(e) dated Oct. 12, 1982, abandoned. This application Dec. 9, 1983, Ser. No. 559,693

Claims priority, application France, Feb. 12, 1981, 81 02941; Oct. 18, 1982, 83 16674; Dec. 9, 1982, 82 20814

Int. Cl.³ C04B *19/04*

U.S. Cl. 106—81 **15 Claims**

1. A process for manufacturing stabilized particles from lignocellulose material, comprising:

mechanically crushing said lignocellulose material to form lignocellulose particles within a desired range of dimensions;

heat treating said particles at a temperature which is caused to decrease from about 800° C. to about 75° C. during said heat treatment; and

subjecting said heat-treated particles to chemical reaction treatment including the steps of:

1. spraying said particles with a calcium salt solution; and

2. spraying said particles with an alkali metal silicate solution, whereby calcium silicate is formed.

4,528,038

ORGANOALUMINOSILOXANE COATING COMPOSITIONS AND COATED SUBSTRATE

Arlene G. Williams, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,412

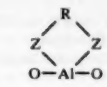
Int. Cl.³ C09K *3/00;* **B32B** *9/00*

U.S. Cl. 106—287.13 **2 Claims**

1. Organoaluminosiloxane coating compositions comprising by weight

(A) 100 parts of an inert organic solvent, and

(B) 10 to 30 parts of an organoaluminosiloxane oligomer having an Al/Si ratio having a value of 5 to 1 and consisting essentially of



units chemically combined with $(R^1)_aSiO_{(4-a)/2}$ units where R is a polyvalent organic radical, R^1 is selected from a $C_{(1-13)}$ monovalent hydrocarbon radical and substituted $C_{(1-13)}$ monovalent hydrocarbon radical, Z is selected from —O—, —S— and —N=, and a has a value of 2.5 to 3.

4,528,039

ALKALINE CLEANING COMPOSITIONS NON-CORROSIVE TOWARD ALUMINUM SURFACES

Fred K. Rubin, Leonia; David Van Blarcom, West Milford, and Daniel J. Fox, Hawthorne, all of, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 465,710, Feb. 11, 1983, Pat. No. 4,457,322. This application Mar. 23, 1984, Ser. No. 592,482

Int. Cl.³ C23G *1/22*

U.S. Cl. 134—2 **10 Claims**

1. An aqueous alkaline cleaning composition for aluminum surfaces which avoids discoloring or tarnishing of the metal surface consisting essentially of a mixture of sodium carbonate and sodium metasilicate in the ratio of about 20:1 to about 1:2, respectively, wherein sodium metasilicate is present in an effective amount up to about 1% by weight of the composition and wherein the pH ranges from about 12.3 to about 12.7.

4,528,040

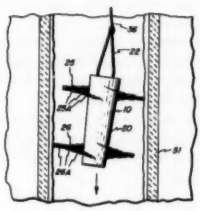
CHIMNEY CLEANING METHOD

Donald P. Vickery, 18 Easterly St., Gloversville, N.Y. 12084

Division of Ser. No. 368,577, Apr. 15, 1982, Pat. No. 4,470,168. This application Apr. 23, 1984, Ser. No. 603,126

Int. Cl.³ B08B *1/00, 9/00*

U.S. Cl. 134—8 **4 Claims**



1. The method of cleaning a chimney flue of creosote deposits, said chimney flue being oriented along a generally vertical axis, which comprises the steps of introducing into the chimney an array of generally horizontally disposed pointed metal rods, moving the rod array while in the chimney transversely of the chimney axis in random manner and intermittently striking rod ends against creosote deposits with sufficient penetrating impact to have a creosote chip-producing effect.

4,528,041

METHOD FOR PIGGING HYDROCARBON PRODUCT FLOWLINES

Wynn P. Rickey, Houston; Deborah H. Dobson, Cypress, and Roger W. Huffaker, Houston, all of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Mar. 7, 1984, Ser. No. 586,927

Int. Cl.³ B08B *9/04*

U.S. Cl. 134—8 **12 Claims**

1. A method for cleaning debris from the interior surface of

a first and second flowline, said method comprising the steps of:

providing a crossover flowline in fluid communication with the first and second flowlines;

disposing a crossover valve in the crossover flowline;

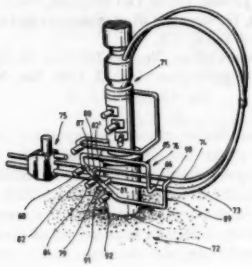
providing a first bypass flowline with a first end in fluid communication with the first flowline and a second end in fluid communication with the crossover flowline;

disposing a first bypass valve in the first bypass flowline;

providing a second bypass flowline with a first end in fluid communication with the second flowline and a second end in fluid communication with the crossover flowline;

disposing a second bypass valve in the second bypass flowline;

establishing a fluid flowpath through the crossover flowline and the first bypass flowline;



pumping a first pig into the first flowline to push debris into the crossover flowline, first bypass flowline, and the second flowline;

stopping the first pig between the crossover flowline and the first end of the first bypass flowline;

establishing a fluid flowpath through the crossover flowline and the second bypass flowline;

pumping a second pig into the second flowline to push debris into the crossover flowline, second bypass flowline, and the first flowline;

stopping the second pig between the crossover flowline and the first end of the second bypass line;

pumping the first pig out of the first flowline to push debris out of the first flowline; and

pumping the second pig out of the second flowline to push debris out of the second flowline, whereby the two flowlines, crossover flowline, and bypass flowlines are cleaned of debris therein.

4,528,042

METHOD FOR PRODUCING SUPERPLASTIC ALUMINUM ALLOYS

Bennie R. Ward, and Richard F. Ashton, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 479,256, Mar. 28, 1983, Pat. No. 4,486,242. This application Jan. 20, 1984, Ser. No. 572,542

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—11.5 A **4 Claims**

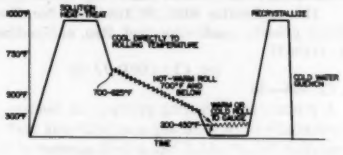
1. A method for producing superplastic aluminum alloy sheet or plate comprising the steps of:

a. providing an aluminum alloy slab of appropriate composition and thickness in an F. temper condition;

b. solution heat treating the aluminum alloy slab of step (a) at a temperature above about 860° F. from about ¼ to about 48 hours;

c. cooling the aluminum alloy slab of step (b) at a rate of between about 20° F./hr and about 100° F./hr to a temperature of between about 600° F. and about 700° F.;

d. hot/warm rolling the aluminum alloy slab of step (c), without prior overaging, at an entry temperature of between about 600° F. and 700° F. and at an exit temperature below about 600° F. to an intermediate gauge under conditions sufficient to impart sufficient strain energy and equivalent cold work as to yield a grain structure below about 20 μm after recrystallization;



e. cooling the product of step (d) to a temperature between about 200° F. and about 450° F.;

f. warm rolling the product of step (e) to final gauge; and

g. rapidly recrystallizing the product of step (f).

4,528,043

SURFACE OXIDE LAYER TREATMENT

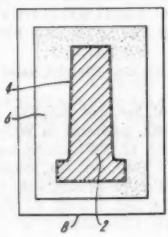
David Mills, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed May 13, 1983, Ser. No. 494,528

Claims priority, application United Kingdom, May 14, 1982, 8214100

Int. Cl.³ C23C *9/00*

U.S. Cl. 148—13.1 **5 Claims**



1. A method of treating a surface oxide layer on an article comprising the steps of contacting the surface oxide layer to be treated with a powdered oxygen scavenge agent and heat treating the article in an inert atmosphere for a sufficient time and at a sufficient temperature to cause the oxygen in the surface oxide layer to diffuse into the powdered oxygen scavenge agent so that a substantially unoxidized material of substantially the same dimensions as the surface oxide layer remains as part of the article.

4,528,044

AQUEOUS QUENCHANTS CONTAINING POLYOXAZOLINES AND N-VINYL HETEROCYCLIC POLYMERS AND THEIR USE IN QUENCHING STEEL

Joseph F. Warchol, West Norriton, Pa., assignor to E. F. Houghton & Co., Valley Forge, Pa.

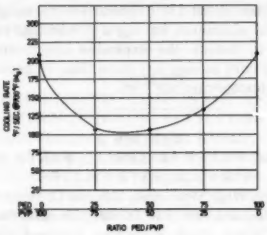
Continuation-in-part of Ser. No. 561,980, Dec. 16, 1983, Pat. No. 4,486,246, which is a continuation-in-part of Ser. No. 495,679, May 18, 1983, abandoned. This application Oct. 12, 1984, Ser. No. 660,092

Int. Cl.³ C21D *1/56*

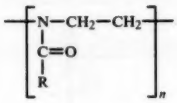
U.S. Cl. 148—18 **51 Claims**

1. In the process of quenching which is useful in the heat treatment of metals wherein a metal is heated to an elevated temperature and said heated metal is then quenched in a bath comprising a liquid quenching medium to effect desirable metallurgical changes in the metal, the improvement which comprises using as said quenching medium an aqueous compo-

sition comprising an effective cooling rate reducing amount of a mixture of (a) a nonionic, water-soluble or water-dispersible



substituted oxazoline polymer having recurring units of the general formula



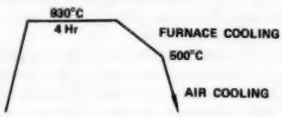
where R is an organic radical which does not significantly alter the nonionic and water-soluble and water-dispersible characteristics of said oxazoline polymer when said polymer is present in said concentrations, and n is an integer such as to provide said oxazoline polymer with a molecular weight of from about 5000 to 1,000,000 and (b) a water-soluble or water-dispersible N-vinyl heterocyclic polymer or copolymer in which the heterocyclic group is composed of carbon, nitrogen and oxygen, said N-vinyl polymer or copolymer having a molecular weight of from about 5000 to about 400,000.

4,528,045

HEAT-RESISTING SPHEROIDAL GRAPHITE CAST IRON

Yoshimasa Tanaka, Ayase; Minoru Uchino, Yokohama; Hideki Yagi, Kumagaya; Iwao Teshima, Kumagaya, and Kensei Matsuki, Kumagaya, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Kabushikikaisha Riken, Tokyo, both of, Japan

Filed Nov. 7, 1983, Ser. No. 549,403
Claims priority, application Japan, Nov. 10, 1982, 57-196092
Int. Cl.³ C22C *37/04*
U.S. Cl. 148—35 **7 Claims**



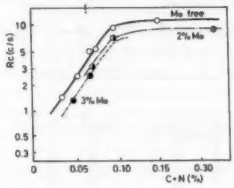
1. A heat-resisting spheroidal graphite cast iron consisting essentially of (a) carbon ranging from 1.8 to 3.4% by weight, (b) silicon ranging from 3.5 to 6% by weight, (c) manganese ranging from 0.7 to 1.25% by weight, (d) chromium ranging from 3 to 5% by weight, (e) nickel ranging from 18 to 24% by weight, and (f) not more than 0.1% by weight of at least one element for spheroidizing graphite, said element for spheroidizing graphite being selected from the group consisting of magnesium, calcium, and cerium, the balance being substantially iron, said cast iron having an austenite matrix.

4,528,046

METHOD OF MANUFACTURING AUSTENITIC STAINLESS STEEL PLATES

Sadahiro Yamamoto, and Chiaki Ouchi, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,085
Claims priority, application Japan, Jul. 22, 1983, 58-132921
Int. Cl.³ C22C *37/00*
U.S. Cl. 148—12 E **1 Claim**



1. A method of manufacturing austenitic stainless steel plates containing up to 0.08 wt. % of carbon, up to 1.0 wt. % of silicon, up to 2.0 wt. % of manganese, 8.0–16.0 Wt. % of nickel, 16.0–20.0 wt. % of chromium, 0–30 wt. % of molybdenum, up to 0.25 wt. % of nitrogen and the balance of iron and inherent impurities, the method comprising the steps of:

rolling a stainless steel blank at a temperature higher than $T_R = 940 + 30$ (% Mo); and

then cooling the rolled blank from a temperature above 800° C. to a temperature below 500° C. at a cooling speed higher than Rc (°C./sec.) shown by the following equations:

$$\log (Rc) = -0.32 + 14(\%\ C + \%\ N) - 0.067(\%\ Mo)$$

when (% C + % N) $\leqq$ 0.1 wt. %; and

$$\log (Rc) = 1.08 - 0.067(\%\ Mo)$$

when (% C + % N) > 0.1 wt. %.

4,528,047

METHOD FOR FORMING A VOID FREE ISOLATION STRUCTURE UTILIZING ETCH AND REFILL TECHNIQUES

Klaus D. Beyer, Poughkeepsie, and Victor J. Silvestri, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

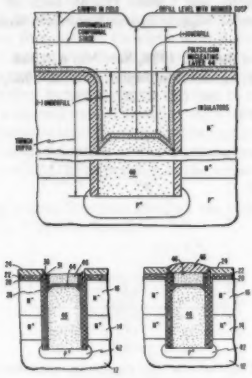
Filed Jun. 25, 1984, Ser. No. 624,425
Int. Cl.³ H01L *21/302, 21/76*
U.S. Cl. 148—175 **12 Claims**

1. Method for forming a void free isolation structure in a monocrystalline silicon body comprising:

providing a substantially vertically sided pattern of trenches having an insulating layer sidewall and monocrystalline silicon bottom;

epitaxially growing monocrystalline silicon in said trenches from said monocrystalline silicon bottom;

ending said monocrystalline growth between about 0.3 to 4.0 micrometers from the top of said trenches; and



depositing polycrystalline silicon over the surface containing said trench and in said trenches until the said trenches are filled.

4,528,048

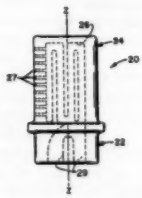
MECHANICALLY WORKED SINGLE CRYSTAL ARTICLE

Maurice L. Gell, Newington, and Anthony F. Giamei, Middletown, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1982, Ser. No. 447,066

Int. Cl.³ C22F *1/10*

U.S. Cl. 148—404 **6 Claims**



1. A single crystal article made of nickel superalloy of the gamma-gamma prime type, the alloy lacking grain boundary strengtheners such as zirconium, boron and hafnium, characterized by a first portion of said part having a 0.2% yield strength at about 600° C. which is at least 15% greater than the corresponding yield strength in a second portion of the part, the first portion having had its cross sectional shape altered by deforming it 2–14% with a strain rate of less than 10^{-1} cm/cm/sec at a temperature in the range 700°–1100° C. to provide it with a greater density of dislocations than the second portion.

4,528,049

SEISMIC EXPLOSIVE COMPOSITION

Lex L. Udy, 4597 Ledgemont Dr., Holladay, Utah 84117, and John T. Day, 5 Dawn Hill, Sandy, Utah 84070

Filed Jul. 9, 1984, Ser. No. 628,809

Int. Cl.³ C06B *45/02*

U.S. Cl. 149—21 **12 Claims**

1. A dry seismic explosive composition comprising:

an admixture of at least one oxidant having a total percentage composition in the range of from about 70% to about 90% by weight;

at least one fuel having a percentage composition in the range of from about 1% to about 3% by weight;

hexamine sensitizer having a percentage composition in the range of from about 5% to about 8% by weight; and

finely divided aluminum having a percentage composition sufficient to initiate the explosive composition with a detonating cord having not more than 18 grains of pentaerythritol tetranitrate per foot.

4,528,050

PRODUCING FILLER MATERIAL, PARTICULARLY FOR CIGARETTE FILTERS

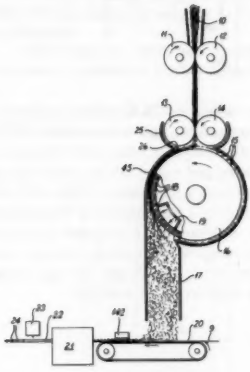
Hugh M. Arther, High Wycombe; Edward G. Preston, Orpington, both of England; David B. Stewart, Dundee, Scotland, and Godfrey A. Wood, High Wycombe, England, assignors to Molins plc, London, England

Filed Jul. 30, 1982, Ser. No. 403,329

Claims priority, application United Kingdom, Jul. 30, 1981, 8123297

Int. Cl.³ B32B *5/02*

U.S. Cl. 156—62.4 **24 Claims**



1. A method of producing filter rod, comprising the steps of conveying a substantially continuous first stream of long filaments, breaking the filaments of said first stream into relatively shorter filaments of irregular lengths by applying tension to the filaments, conveying a carrier stream of filaments, depositing the broken filaments from said first stream on the carrier stream so that the broken filaments are arranged in substantially random orientations on the carrier stream with the carrier stream supporting and conveying said broken shorter filaments so as to form a combined stream having separate first and second regions, said first region containing predominantly said carrier stream and said second region containing predominantly said broken filaments, and forming said combined stream into continuous filter rod.

2. Apparatus for producing filler material, comprising means for conveying a substantially continuous first stream of long filaments, means for engaging said first stream and for breaking the filaments into relatively shorter filaments of irregular lengths, said engaging means including a conveyor having a surface adapted to engage said filaments and means for driving the conveyor such that the filaments of the stream are engaged by the surface of the conveyor and broken into irregular lengths by tension applied to the filaments, means for conveying a carrier stream of filaments, and means for combining the broken filaments from said first stream with the carrier stream to form a combined stream with said carrier stream supporting and conveying said broken filaments during further conveyance of said combined stream, said combining means including means for projecting said broken filaments onto said carrier stream in substantially random orientations and in such a way

that said combined stream has separate first and second regions, said first region containing predominantly said carrier stream and said second region containing predominantly said broken filaments and means for forming a continuous filter rod from the combined stream.

4,528,051

FIBER REINFORCED COMPONENT AND METHOD FOR STRENGTHENING SUCH COMPONENTS

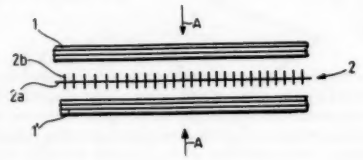
Frank Heinze, Hamburg, and Heinz Richter, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mbH, Munich, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,704

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246803

Int. Cl.³ B32B *7/08*

U.S. Cl. 156—92 **8 Claims**



1. A method for strengthening a fiber reinforced structural component in which reinforcing fibers are embedded in a resin matrix comprising the following steps: arranging at least two resin preimpregnated fiber layers in parallel to each other, securing a plurality of reinforcing pins to a pin carrier (*2, 2a*), pressing said pin carrier with the pins secured thereto in a direction substantially perpendicularly to a plane defined by said preimpregnated fiber layers for driving said plurality of pins into both layers so that the pins extend approximately perpendicularly to an orientation of said fibers in said layers, compressing said preimpregnated fiber layers with said pins therein, and curing said resin matrix for bonding the resin matrix to said fibers and to said pins.

4,528,052

PROCESS FOR MAKING A RADIAL TIRE

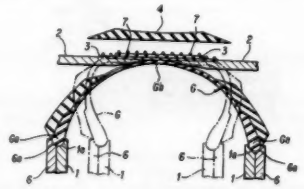
Atsuyoshi Yoshie, and Hiroyuki Karasawa, both of Mie, Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Dec. 16, 1982, Ser. No. 450,555

Claims priority, application Japan, Feb. 17, 1982, 57-25077

Int. Cl.³ B29H *17/26, 5/02*

U.S. Cl. 156—117 **2 Claims**



1. A process for making a radial tire comprising the steps of:
transforming a cylindrical tire carcass assembly including a carcass ply layer, bead portions, and side wall rubbers into a toroidal shape,
laying over a given number of belts in an endless form on the upper surface thereof,
winding a plurality of synthetic fiber threads over the top of the given number of belts in the circumferential direction, with a space of 5 mm to 15 mm left between each adjacent thread, in the range of more than 70% of the width of the belts,
laying over a tread cap thereon,
retaining said tire carcass assembly by sandwiching bead portions thereof between rims of outer flanges and inner flanges provided at a tire building machine,
bringing the bead portions toward each other,
contacting the upper surface of the tire carcass assembly substantially all over the lower surface of the lowest given number of the belts so that deformation of the belts and the tread cap is lessened, resulting in diminution of wrinkles,
joining integrally the tire carcass assembly, the belts, the threads, and the tread cap to form a green tire having an equatorial diameter larger by about 2% than an equatorial diameter of a vulcanizing mold, so that less slipping of the green tire occurs in the vulcanizing mold,
subjecting said green tire to vulcanization in the vulcanizing mold;
whereby uniformity of the radial tires produced is greatly improved.

4,528,053

MANUFACTURING FIBERBOARD DUCTS

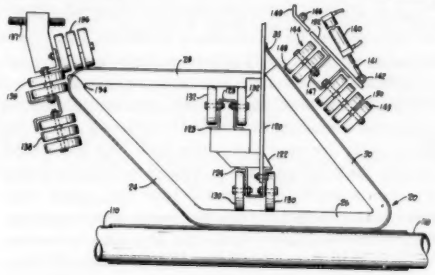
Mark J. Auer, 23520 Lake Rd., Bay Village, Ohio 44140

Continuation-in-part of Ser. No. 428,147, Sep. 29, 1982, Pat. No. 4,461,664. This application Jul. 6, 1984, Ser. No. 628,640

The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.

Int. Cl.³ B31F *1/00, 7/00*

U.S. Cl. 156—204 **23 Claims**



1. An apparatus for fabricating a flat fiberboard duct made from a flat fiberboard having a plurality of linear sections comprising two intermediate sections and two outer end sections which terminate laterally with linear edges adapted to be secured together to form a linear seam, the first outer end section having a linear flap adjacent to the first outer end section linear edge and adapted to overlap the linear seam and be secured to the second outer end section adjacent to the second outer end section linear edge to form a folded fiberboard duct, the apparatus comprising:
a supporting frame;
drive conveyor means supported by said frame adapted to collapse said flat fiberboard into a collapsed fiberboard and advance the collapsed fiberboard through the apparatus from the rear entrance to the forward exit of the apparatus;
a linear guide means supported by said supporting frame overhead said drive conveyor at the entrance portion of said apparatus where said guide means is adapted to engage and maintain square the first outer end section linear distal edge and the second outer end section distal edge and to bend said flap upwardly while said conveyor advances the collapsed fiberboard forwardly through said apparatus, whereby said guide means maintains square alignment of the collapsed fiberboard with said linear guide means at the entrance portion of the apparatus, said

linear guide means terminating forwardly of the entrance portion of the apparatus;

flattening means supported by said frame and disposed forwardly adjacent to the termination of said guide means, said flattening means adapted to engage the upwardly directed flap of the advancing collapsed fiberboard and flatten the flap onto the second outer end section of the collapsed fiberboard;

preheat means supported by said frame and disposed forwardly adjacent to flattening means for preheating the flap of said collapsed fiberboard duct while advancing through the apparatus;

tape dispensing means supported by said frame adapted to dispense a predetermined length of heat sensitive tape to be applied in a taping area located forward of said preheating means to secure the preheated flap and second outer end section of the collapsed fiberboard, whereby the tape secures the linear seam of the collapsed fiberboard;

heating iron means supported by said frame and disposed forwardly of said taping area, said heating iron adapted to heat the tape and provide applied pressure to the heated tape whereby the heated tape adheres to the flap and second outer end section of the collapsed fiberboard; and

cooling means supported by said frame and disposed forwardly of said heating means, said cooling means adapted to cool the heated tape and secure the linear seam of the collapsed fiberboard, whereby the collapsed fiberboard can be removed from the exit portion of the apparatus.

23. In a process for fabricating a fiberboard duct from a fiberboard having a plurality of linear sections comprising two intermediate sections and two outer end sections which terminate laterally with linear edges adapted to be secured together to form a linear seam, the first outer section having a linear flap adjacent to the first outer end section linear edge and adapted to overlap the linear seam and be secured to the second outer end section adjacent to the second outer end section linear edge to form a fiberboard duct, the process steps comprising:

folding the fiberboard wherein the first outer end section and second outer end section meet to provide a folded fiberboard duct having the distal linear edges of the first and second outer end section form a linear seam;

advancing the folded fiberboard duct and aligning the linear seam with a centrally disposed downwardly depending linear guide means supported overhead for advancing the folded fiberboard where each distal linear edge of the outer end sections engage the linear guide means to maintain the folded fiberboard in square alignment with the linear guide means;

partially collapsing the folded fiberboard between converging conveying means to form a partially collapsed fiberboard duct while maintaining the partially collapsed fiberboard duct in alignment with said linear guide means;

preheating the seam of the partially collapsed fiberboard duct while maintaining alignment with said linear guide means;

applying heat sensitive tape to the seam of said partially collapsed fiberboard duct while maintaining alignment with said linear guide means;

heating and pressing the heat sensitive tape to secure the tape whereby the tape secures the fiberboard flap to the second outer end section;

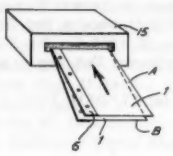
cooling the heated tape to set the while removing the partially collapsed fiberboard duct.

4,528,054

METHOD FOR MAKING OVERHEAD PROJECTION TRANSPARENCY

Torbjorn Stahl, Malmo, Sweden; Per Hektoen, Osterås, and Oystein Karlsen, Oslo, both of Norway, assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 30, 1984, Ser. No. 615,516
Claims priority, application Norway, Jun. 1, 1983, 831979
Int. Cl.³ B32B *31/16*
U.S. Cl. 156—226 **3 Claims**



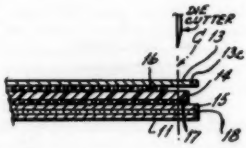
1. A method for making overhead projection transparencies, characterized by the steps of arranging a first web of a thin transparent plastic film on a second web of paper, said first web being attached along one longitudinal edge thereof by means of a line adhesive, the upper face of the first web having a writable/printable surface and the lower face thereof having a non-writable/non-printable surface, in the longitudinal direction of the webs on a first of two sections of said writable/-printable surface of the first web, providing information to be displayed by overhead projection, while leaving the second section blank, removing the second web or portions thereof from the first web, folding the first web and any remainder of the second web such that the writable/printable surfaces of the said two sections face each other, said writable/printable surfaces being heat weldable to each other, and feeding the assembly of the first web and any remainder of the second web through a heat sealing means to weld the said two sections together to produce the overhead transparency.

4,528,055

METHOD OF MANUFACTURING AN ELONGATED LABEL SUPPLY

James C. Hattemer, Cincinnati, Ohio, assignor to Graphic Resources, Inc., Cincinnati, Ohio

Division of Ser. No. 450,538, Dec. 17, 1982,. This application Nov. 16, 1983, Ser. No. 552,447
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—247 **10 Claims**



1. A method of manufacturing an elongated label supply comprising the steps of:

printing at least an underside of a first web with ink;

applying adhesive to both sides of a barrier web;

joining said web to said barrier web, while the adhesive between the first web and the barrier web is viscous and the ink on said first web is wet;

joining said barrier web to a second web provided with a pressure sensitive adhesive and elongated backing release web; and

die cutting said first web, barrier web and said second web on said release web to define a plurality of separate com-

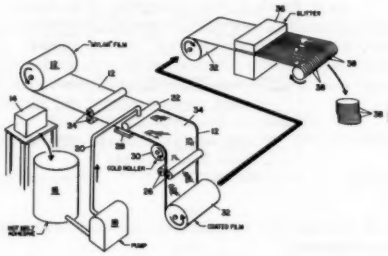
posite labels comprising a top sheet, first adhesive layer, barrier sheet, second adhesive layer and pressure sensitive base sheet on said release web.

4,528,056

CURL FREE REINFORCED PAPER SHEET TECHNIQUE

Stuart B. D. Hunt, Lake Forest; Philip B. Chandler, Tinley Park, and Thomas L. Harrison, Villa Park, all of Ill., assignors to Avery International Corp., Pasadena, Calif.

Filed Feb. 17, 1983, Ser. No. 467,269
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—253 **11 Claims**



1. A process for making and using reinforced non-jamming paper sheets in high speed copying machines comprising the steps of:

coating wide rolls of low friction polymer film one-thousandth of an inch or less in thickness, with a thin layer of heat activated adhesive one thousandth of an inch or less in thickness;

cooling the adhesive coated film to harden the adhesive;

rolling the coated film up;

slitting the rolls of coated film into thin strips in the order of one-half inch wide;

rolling up the thin strips of adhesive coated film;

heating the thin strips of adhesive coated film to activate the adhesive;

applying the thin strips of preheated coated film simultaneously to both sides of the paper near but slightly spaced from one edge of the paper, to avoid asymmetric stressing of the edges of the paper, thereby preventing curling thereof;

cutting the double-side reinforced paper into sheets; and

feeding the reinforced sheets of paper into a high speed copier machine;

whereby the double side reinforced paper is substantially curl-free and does not jam the copier machines.

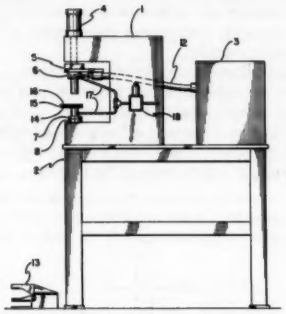
4,528,057

ADHESIVE SPOT CURING PRESS AND METHOD FOR METALLIC PARTS

Richard Challenger, Cortland, and William E. Mullane, Warren, both of Ohio, assignors to The Taylor-Winfield Corporation, Warren, Ohio

Filed Sep. 8, 1983, Ser. No. 530,393
Int. Cl.³ B32B *31/28*
U.S. Cl. 156—273.7 **6 Claims**

2. A method for spot curing two metallic pieces having an adhesive layer sandwiched therebetween using an adhesive spot curing press mounted on a table and comprising a C-shaped frame having mounted thereon an upper and lower platen on the respective extremities of said frame, a tooling holder attached to each platen, an induction coil enclosed by a non-metallic housing attached to one of said platens, an induction current generator connected to said coil, fluid operating means mounted on one of said platens for clamping said platens together after there has been inserted, therebetween, metallic pieces having sandwiched therebetween an adhesive, and air cooling means connected to the tooling holder for at least one of said platens, comprising clamping together said pieces between said tooling holders with said adhesive layer between, applying induction heating current by said induction coil in



only one central spot, leaving the remainder of the layer uncured and thereafter air cooling by said air cooling means and unclamping said pieces and thereafter curing said remainder of the layer.

4,528,058

METHOD OF BONDING ION EXCHANGE MEMBRANE OF FLUORINATED POLYMER TO SYNTHETIC RESIN

Tatsuro Asawa; Tsuneji Ishii, and Tomoki Gunjima, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 199,249, Oct. 21, 1980, abandoned. This application Mar. 16, 1983, Ser. No. 473,982
Claims priority, application Japan, Nov. 13, 1979, 54-146055
Int. Cl.³ C09J *5/00, 7/00*
U.S. Cl. 156—306.6 **7 Claims**

1. A method of bonding an ion exchange membrane of a fluorinated polymer having ion exchange groups to a synthetic resin, comprising:

bonding said membrane to said synthetic resin with a binder being in the form of a cloth having a thickness of 25 to 250μ, a denier of 50 to 500 and a mesh of 15 to 500, and formed of a material selected from the group consisting of polyaryl ethers, polyolefins and fluorinated polymers selected from the group consisting of polytetrafluoroethylene, polytrifluorochloroethylene, copolymers of tetrafluoroethylene and hexafluoropropylene, copolymers of tetrafluoroethylene and perfluorovinyl ether, polyvinylidene fluoride copolymers of tetrafluoroethylene and ethylene, copolymers of tetrafluoroethylene and vinylidene fluoride and copolymers of tetrafluoroethylene and propylene, said synthetic resin being selected from the same group of materials which constitute said binder and wherein interlayer between said binder and ion exchange membrane has an unevenness characterized by a pitch of less than 2 mm and a depth of more than 20 microns.

4,528,059

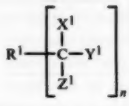
ANAEROBICALLY-CUTING COMPOSITIONS

Edward W. Janssen, Roseville, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

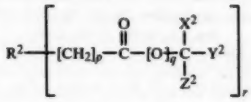
Division of Ser. No. 289,702, Aug. 3, 1981, Pat. No. 4,413,108, which is a continuation-in-part of Ser. No. 203,683, Nov. 3, 1980, abandoned. This application Aug. 19, 1983, Ser. No. 524,860
Int. Cl.³ C09J *5/02*
U.S. Cl. 156—307.3 **15 Claims**

1. A method for bonding air-impermeable substrates using an adhesive composition which is cured anaerobically, said method comprising the steps of:

(a) applying said adhesive composition to at least one substrate to be bonded;
(b) bringing the substrates into abutting relation in a manner to provide an anaerobically curable environment for said adhesive composition; and
(c) maintaining said substrates in said abutting relation until said adhesive composition polymerizes and bonds said substrates together;
wherein said adhesive composition comprises:
(1) a polymerizable monomer having at least one α-β unsaturated carboxyl functionality per molecule of monomer;
(2) an effective amount of a halogen-containing compound as a first initiator component and selected from the group consisting of compounds of the formula



wherein:
X^1 is selected from the group consisting of H, CH_3, Cl and Br;
Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;
R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and
n is an integer from 1 to 3 inclusive; compounds of the formula



wherein:
X^2 is selected from the group consisting of H, Cl, Br and CN;
Y^2 and Z^2 are each selected independently from the group consisting of Cl and Br;
R^2 is selected from the group consisting of $-NH_2$, an alkyl radical comprising 1 to about 10 carbon atoms, an aryl radical comprising 1 to about 10 carbon atoms, a methoxy-substituted aryl radical comprising 1 to about 10 carbon atoms and a methyl-substituted aryl radical comprising 1 to about 10 carbon atoms;
p is 0 or 1;
q is 0 or 1; and
r is 1 or 2;
1-trichloromethyl-cis-perhydropentalene; and
1,1,1-trichloro-2-methyl-2-propanol hydrate;
(3) as a second initiator component, an effective amount of an organic thiol selected from the group consisting of compounds of the formula

R^4—SH

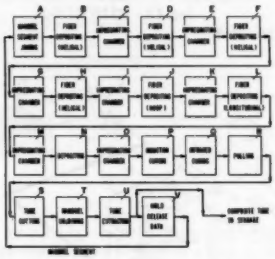
wherein:
R^4 is an unsubstituted hydrocarbon group of 1 to about 10 carbons;
a mercaptoester, 2,3-dimercapto succinic acid, thiomalic acid, oxydibenzyl mercaptan, and pentachlorothiolphenol; and;
(4) a sufficient amount of an inhibitor of free-radical polymerization to retard polymerization of said composition while in the presence of air.

4,528,060

APPARATUS FOR WINDING OF FILAMENTARY COMPOSITES

Dee R. Gill, Sandy, and Rex B. Marks, Roy, both of Utah, assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 396,536, Jul. 8, 1982,. This application Dec. 30, 1983, Ser. No. 567,446
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—432 **16 Claims**



1. A machine that manufactures composite tubes, said machine comprising:
an elongate segmented mandrel having plurality of threaded mandrel segments that endwise thread together in forming said segmented mandrel;
an axially reciprocating wrench for periodically engaging a next-in-line free mandrel segment, translating said free mandrel segment into engagement with a trailing segment of said segmented mandrel and rotating said fresh mandrel segment into threaded relation with said trailing mandrel segment;
an axially reciprocating grip jaw for gripping said segmented mandrel during threading of said fresh mandrel segment to said segmented mandrel;
a plurality of spaced filament applicators for depositing continuous filaments around said segmented mandrel as said segmented mandrel is drawn lengthwise past said filament applicators;
a plurality of resin applicators in alternating spaced relation with a portion of said filament applicators, said resin applicators for impregnating with resin those of said filaments previously applied around said segmented mandrel;
a resin hardening device downstream from said resin applicators, said hardening device for causing said resin to harden to provide a tubular composite around that portion of said segmented mandrel that has left said resin hardening device;
a puller for pulling on that portion of said tubular composite that has hardened sufficiently to accept gripping by said puller, said puller drawing said segmented mandrel past said filament and resin applicators and said hardening device;
an axially reciprocating saw for periodically severing said tubular composite adjacent junctures between adjacently joined segments of said segmented mandrel that are pushed to said reciprocating saw by said puller so as to provide composite tubes around respective mandrel segments passing said saw;
an axially reciprocating grip jaw for gripping said segmented mandrel about a next-in-line leading mandrel segment next behind a then leading mandrel segment while said then leading mandrel segment is unthreaded from said next-in-line leading mandrel segment;
an axially reciprocating wrench for periodically engaging said then leading mandrel segment, rotating said then leading mandrel segment out of threaded relation with said next-in-line leading mandrel segment and then axially translating said then leading mandrel segment in the direc-

tion that said segmented mandrel translates for disengaging said then leading mandrel segment from said segmented mandrel;

a transversely reciprocating pusher for periodically pushing a once leading but now disengaged mandrel segment carrying a composite tube off to the side of said segmented mandrel once said disengaged segment is released by said reciprocating wrench;

an extractor for extracting mandrel segments from said composite tubes.

4,528,061

PROCESS FOR MANUFACTURING BORON-DOPED GALLIUM ARSENIDE SINGLE CRYSTAL

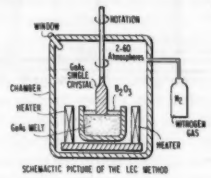
Shintaro Miyazawa; Yasushi Nanishi, both of Kanagawa; Kohji Tada, Osaka; Akihisa Kawasaki, Osaka, and Toshihiro Kotani, Osaka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Apr. 15, 1983, Ser. No. 485,355

Claims priority, application Japan, Apr. 16, 1982, 57-64508

Int. Cl.³ C30B *15/04*

U.S. Cl. 156—605 **7 Claims**



SCHEMATIC PICTURE OF THE LEC METHOD

1. A process for manufacturing a boron-doped GaAs single crystal containing a large quantity of boron, comprising:

preparing a mixture of boron, gallium and arsenic covered by a liquid B_2O_3 encapsulant;

melting the mixture;

pulling up a boron-doped GaAs body from the melted mixture in accordance with the LEC (Liquid Encapsulated Czochralski) method in which a seed is employed;

crushing the body into small pieces after removing the seed end therefrom;

remelting the pieces in the presence of B_2O_3; and

pulling up a single crystal from the remelted pieces in accordance with the LEC method.

4,528,062

METHOD OF MANUFACTURING A SINGLE CRYSTAL OF A III–V COMPOUND

Michel Kleinhans, Mondeville, and Michel Gaffre, Caen, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 244,582, Mar. 17, 1981, abandoned, which is a continuation of Ser. No. 9,209, Feb. 5, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,888

Claims priority, application France, Feb. 9, 1978, 78 03631

Int. Cl.³ C30B *25/00*

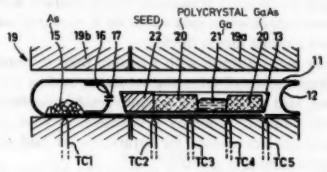
U.S. Cl. 156—611 **5 Claims**

1. A method of manufacturing a semiconductor monocrystal of a III-V compound, which compound consists of a first, relatively volatile element, and a second, relatively non-volatile, element, said method comprising:

(a) placing a quantity of a polycrystalline form of said III-V compound together with a significant amount of said second, relatively non-volatile element in a first portion of a closed space in a first heating zone of a furnace,

(b) placing in a second portion of said closed space, and in a second heating zone of said furnace, a quantity of said first, relatively volatile element sufficiently in excess of the stoichiometric quantity thereof required to react with said amount of said second, relatively non-volatile element to provide a vapor pressure of said relatively volatile element, in said closed space, sufficiently large to counteract the dissociation of said III-V compound at a temperature approximately that of the melting point of said III–V compound,

(c) raising the temperature of said first heating zone sufficiently to dissolve said polycrystalline semiconductor III-V compound in said second, relatively non-volatile element, but below the melting point of said III-V compound, heating while raising the temperature of said second heating zone to a point sufficiently high to cause the formation and maintenance of a vapor pressure of said first, relatively volatile element in said closed space but insufficient to cause saturation of the resultant solution of said dissolved polycrystalline III-V compound by the compound formed by the reaction of the vapors of the



relatively volatile first element with said relatively non-volatile second element present in said solution,

(d) maintaining the resultant temperature differential between said first and second heating zones until most of said second, relatively non-volatile, element in which said molten polycrystalline III-V compound is dissolved is reacted with said relatively volatile, first element,

(e) slowly increasing the temperature of second heating zone to bring the temperature of said relatively volatile first element to the melting point of said first element for a time sufficient to cause said first, relatively volatile, element to combine with the remainder of said second, relatively non-volatile element in which said III-V polycrystalline compound is dissolved,

(f) increasing the temperature of said first heating zone to the melting point of said III-V compound, and

(g) crystallizing said resultant liquid phase by decreasing the temperature profile of said liquid phase.

4,528,063

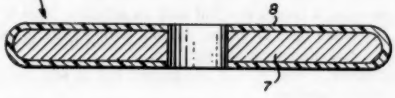
METHOD FOR REFINISHING RIGID DATA STORAGE DISCS

John E. Lawrence, Cupertino, and Lloyd L. Barnes, Jr., Campbell, both of Calif., assignors to Winchester Disc, Inc., Milpitas, Calif.

Filed Jun. 15, 1984, Ser. No. 620,961

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—626 **20 Claims**



1. A method for refinishing data storage discs, comprising the steps of:

removing from a data storage disc a coating adhered to a planar surface of a rigid substrate to expose the substrate surface;

measuring the actual thickness and flatness of said substrate;

inspecting said planar surface for surface discontinuities exceeding a predetermined depth;

inspecting the texture of said planar surface for roughness exceeding a predetermined roughness value;

comparing the actual thickness value of said substrate with a predetermined thickness value;

comparing the actual flatness of said substrate with a predetermined flatness value;

resurfacing said planar surface of those said substrate having actual flatness values greater than or equal to said predetermined flatness values to create resurfaced substrate having a planar surface of a flatness value less than said predetermined flatness value;

polishing said resurfaced substrate and non-discarded substrate to create a visually discontinuity-free substrate without tapering the edges of said substrate beyond a predetermined level, whereby said predetermined level maintains and ensures that said substrate edges are sufficient to prevent transducer head contact with said substrate edges when said substrate is recoated and used in a data storage media device;

rinsing said substrate with a rinsing fluid to remove residue foreign material from the substrate; and

drying said substrate to remove residue rinsing fluid from said substrate whereby a chemically clean coating free substrate acceptable for future use in said data storage media device is created.

4,528,064

METHOD OF MAKING MULTILAYER CIRCUIT BOARD

Kenji Ohsawa, Yokohama; Takao Ito, Ohta; Masayuki Ohsawa, and Keiji Kurata, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

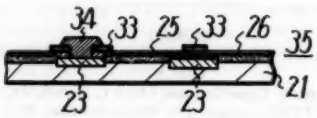
PCT No. PCT/JP81/00371, § 371 Date Aug. 5, 1982, § 102(e) Date Aug. 5, 1982, PCT Pub. No. WO82/02138, PCT Pub. Date Jun. 24, 1982

Division of Ser. No. 406,231, Aug. 5, 1982, abandoned. This PCT application Dec. 8, 1981, Ser. No. 670,912

Claims priority, application Japan, Dec. 8, 1980, 55-175739[U]

Int. Cl.[3] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—630 **8 Claims**



1. The method of fabricating a multilayer circuit board comprising the steps of:

forming a first wiring pattern having a predetermined location for a connection portion on an insulating substrate,

forming an insulating resin layer on said first wiring pattern,

laminating a conductive foil with an adhesive layer to said insulating resin layer and the first wiring pattern, including said predetermined location,

providing a void in said conductive foil at said predetermined location,

etching said conductive foil to form a second wiring pattern,

removing the adhesive layer at said predetermined location to form a passage between said first wiring pattern and said second wiring pattern, and

filling the passage with a conductive substance to establish electrical continuity between said first and second wiring patterns.

4,528,065

PHOTOELECTRIC CONVERSION DEVICE AND ITS MANUFACTURING METHOD

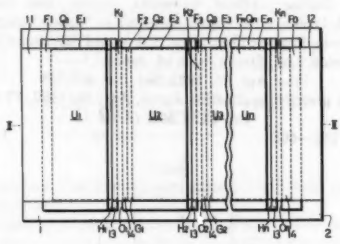
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 555,317, Nov. 25, 1983,. This application Jun. 14, 1984, Ser. No. 620,462

Claims priority, application Japan, Nov. 24, 1982, 57-206806; Nov. 24, 1982, 57-206809; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713

Int. Cl.[3] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—643 **11 Claims**



1. A method of making a photoelectric conversion device, comprising the steps of:

forming a first conductive layer on a substrate having a insulating surface;

subjecting the first conductive layer to first laser beam scanning to form therein (n−1) (where n is an integer larger than 2) sequentially arranged first grooves G_1 to G_{n-1} and n sequentially arranged first electrodes E_1 to E_n separated by the first grooves G_1 to G_{n-1}, respectively;

forming on the substrate a non-single-crystal semiconductor laminate layer having formed therein at least one semiconductor junction to cover the first grooves G_1 to G_{n-1} and the first electrodes E_1 to E_n so that the regions of the non-single-crystal semiconductor laminate member on the electrodes E_1 to E_n may be non-single-crystal semiconductor laminate members Q_1 to Q_n;

subjecting the non-single-crystal semiconductor laminate member to second laser beam scanning to form non-single-crystal semiconductor laminate members Q_1 to Q_n second grooves O_1 to O_{n-1} extending into the first electrodes E_1 to E_{n-1}, respectively;

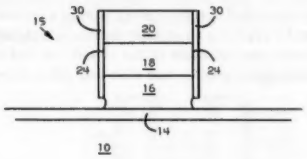
forming a second conductive layer which continuously extends on the non-single-crystal semiconductor laminate members Q_1 to Q_n and extends into the grooves O_1 to O_{n-1} to provide coupling portions K_1 to K_{n-1} which are connected to the first electrodes E_1 to E_{n-1} through the grooves O_1 to O_{n-1}; and

subjecting the second conductive layer to third laser beam scanning to form isolating portion H_1 to H_{n-1} on the non-single-crystal semiconductor laminate members Q_1 to Q_{n-1}, respectively, and n sequentially arranged second electrodes F_1 to F_n which are isolated by the isolating portions H_1 to H_{n-1}, respectively, and opposite the first electrodes E_1 to E_n through the non-single-crystal semiconductor laminate members Q_1 to Q_n, respectively, the second electrode F_{j+1} (j=1, 2, . . . (n−1)) being connected to the first electrode E_j through the coupling portion K_j.

4,528,066
SELECTIVE ANISOTROPIC REACTIVE ION ETCHING PROCESS FOR POLYSILICIDE COMPOSITE STRUCTURES

Robert M. Merkling, Jr., Gainesville, and David Stanasolovich, Manassas, both of Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,558
Int. Cl.[3] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 14 Claims



1. A reactive ion etching process for etching a composite layer structure including a first layer of polycrystalline silicon and a second superincumbent layer of a refractory metal silicide having a patterned portion exposed through an etching mask, comprising the steps of:

etching with an anisotropic etching composition including a fluorocarbon etchant species and a fluorine gettering species, to etch completely through said refractory metal silicide layer and partially through said polycrystalline silicon layer, leaving said patterned portion unetched;

forming a fluorocarbon polymer on the horizontal and vertical surfaces of said patterned portion and on either side of said patterned portion;

directionally etching said portions of said fluorocarbon polymer deposited on horizontal surfaces of said patterned portion and on horizontal surfaces on either side of said patterned portion;

etching to remove said residual horizontal portion of said polycrystalline silicon layer on either side of said patterned portion;

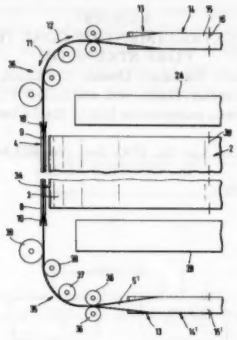
whereby a precisely defined vertical sidewall pattern structure is formed without etching portions of the workpiece on either side of said patterned portion.

4,528,067
DEVICE FOR WEB REMOVAL FROM A CYLINDER

Börje J. Hedberg, Lantmannav. 53, Trollhättan, Sweden

Filed May 24, 1983, Ser. No. 497,580
Claims priority, application Sweden, May 25, 1982, 8203218
Int. Cl.[3] D21G *5/00*
U.S. Cl. 162—281 8 Claims

1. A device for removing a web from a cylinder, comprising: a band-shaped doctor blade, means for guiding said doctor blade along the mantle surface of the cylinder, first and second winding-up mechanisms for the blade, respectively arranged on opposite sides of the cylinder, each winding-up mechanism having an expandable chuck with an axis of rotation extending in the same direction as the axis of rotation of said cylinder, and driving means connected to said winding-up mechanisms for feeding the doctor blade from a spool on the chuck of the first winding-up mechanism on one side of the cylinder to a second

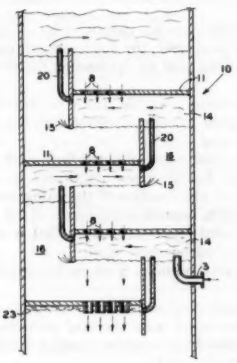


chuck on the second winding-up mechanism on the other side of the cylinder, and vice versa.

4,528,068
TRAY APPARATUS FOR DEASPHALTING AND EXTRACTION

Robert J. Fiocco, Summit, and Edward Niessen, Passaic, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 22, 1984, Ser. No. 592,381
Int. Cl.[3] C10G *21/00*
U.S. Cl. 196—14.52 6 Claims



1. In an extraction tower of the sealed sieve tray type for contacting and extracting a first continuous phase fluid in countercurrent flow with a second fluid and wherein said tower has a plurality of horizontally disposed sieve trays each of which has vertical end weirs for retention of a portion of said first continuous phase fluid over the surface of said sieve tray and over which the balance of said first continuous phase fluid flows, said end weirs defining a conduit with the wall of the tower for passage of the first continuous phase which overflows said weir from tray to tray on its progression through the tower, the improvement comprising: pipe means located in at least a portion of said conduits, said pipe means having a first end opening in said end weir and a second end opening above the next succeeding sieve tray in the tower for conveying at least a portion of said first phase fluid to the next succeeding sieve tray in the tower without significant disper-

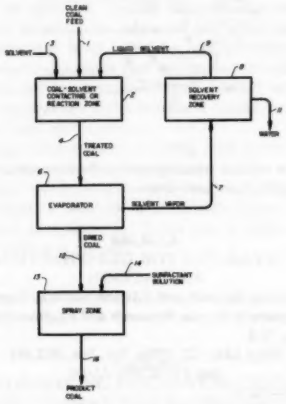
sion into droplets whereby entrainment of said first phase and said second phase is minimized.

4,528,069

SOLVENT PRETREATMENT OF COAL TO IMPROVE COKE STRENGTH

William DuBroff, Munster; Dennis D. Kaegi, Crown Point; Jerome J. Knoerzer, Hammond, and Elliott Y. Spearin, Crown Point, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Apr. 11, 1983, Ser. No. 483,543
Int. Cl.³ C10B *57/12*
U.S. Cl. 201—20 **16 Claims**



1. In the high temperature carbonization of coking coal for making metallurgical coke, the improvement enabling the use of an inferior coking coal by pretreating the coal, comprising the steps of:

providing a coking coal that, prior to treatment, does not yield coke having the expected stability index based on the rank of the coal,

contacting the coal in comminuted form with a halogenated hydrocarbon liquid under conditions to effect limited dissolution of, and reaction of the halogenated hydrocarbon liquid with, organic components of the coal to form a solvent induced reaction product that is soluble in said halogenated hydrocarbon liquid,

separating the coal particles from the halogenated hydrocarbon liquid,

effecting volatilization and removal of residual halogenated hydrocarbon liquid from the coal particles and thereby depositing dissolved reaction product on the surfaces of the coal particles, and

thereafter subjecting the pretreated coal to high temperature carbonization, whereby to obtain metallurgical coke having an improved stability index and wherein the improvement in stability index is greater than that attributable to a reduction in the ash content of the coal.

4,528,070

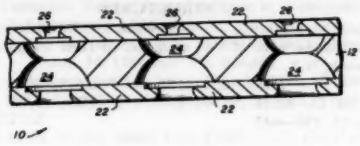
ORIFICE PLATE CONSTRUCTIONS

Rodger L. Gamblin, Dayton, Ohio, assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 4, 1983, Ser. No. 464,101
Int. Cl.³ C25D *1/08*
U.S. Cl. 204—11 **41 Claims**

1. A method of making an apertured member using a chemical etchant which method comprises:

depositing a layer of an amorphous phosphorus-containing metal alloy on at least one surface of a corrosion resistant substrate in a predetermined pattern defining a predetermined array of openings therein, and



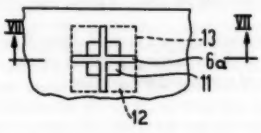
selectively chemically etching away at least a portion of said substrate by applying an etchant thereto which selectively etches away said substrate in the vicinity of said openings at a substantially greater rate than said alloy layer.

4,528,071

PROCESS FOR THE PRODUCTION OF MASKS HAVING A METAL CARRIER FOIL

Walter Glashauser, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,295
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338717
Int. Cl.³ C25D *1/08, 5/02, 5/12*
U.S. Cl. 204—11 **10 Claims**

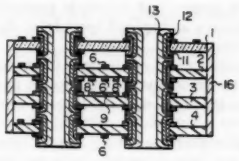


1. A method for producing masks for x-ray lithography to produce a pattern in an x-ray resist during a reproduction process, said masks consisting of a frame having an opening, a carrier foil being clamped to the frame to extend across the opening and being of a metal which is permeable to x-ray and a mask structure of a desired pattern being arranged on the carrier foil and being impermeable to x-ray radiation, said method comprising the steps of providing a metal carrier plate, applying a first metal layer on a surface of said carrier plate, then depositing a second metal on the first metal layer to a thickness in a range of 1–3 μm to form a carrier foil, applying a polymethylmethacrylate layer of a thickness in the range of 10–15 μm on the second metal layer, structuring the polymethylmethacrylate layer to create a plating mask which provides exposed surface portions of the second layer, electroplating a third metal layer of nickel to a thickness in the range of 1–2 μm on the exposed portions of the second metal layer; then electroplating a gold layer to a thickness in the range of 8–10 μm on the third layer of metal, subsequently etching the carrier plate without etching the first metal layer to form the frame with the opening exposing a portion of the first layer and then selectively etching the exposed portion of the first metal layer to expose at least one portion of the carrier foil.

4,528,072
PROCESS FOR MANUFACTURING HOLLOW MULTILAYER PRINTED WIRING BOARD

Keiji Kurosawa; Kenji Yamamoto; Mirsuo Yamashita; Hisami Mitsui; Ayako Miyabara, all of Nagano; Kiyotaka Miyagawa, Suzaka, and Takayoshi Imura, Nagano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 229,594, filed as PCT JP80/00111, May 23, 1980, published as WO80/02633, Nov. 27, 1980, § 102(e) date Jan. 16, 1981, Pat. No. 4,368,503.
This application Jun. 29, 1982, Ser. No. 393,324
Claims priority, application Japan, May 24, 1979, 54-64329
Int. Cl.³ C25D *5/02, 5/34, 5/50*
U.S. Cl. 204—15 **27 Claims**



1. A process for manufacturing a hollow multilayer printed wiring board comprising the steps of:

preparing printed substrates made of a material comprising one of a thermally resistant organic synthetic resin sheet, an insulation treated metal sheet, and a combination of a thermally resistant organic synthetic resin sheet on an insulation-treated metal sheet, so that each said printed substrate has a signal conductor pattern on at least one surface thereof and a land conductor pattern on at least one surface thereof, and further so that each said substrate has a layer of a low melting point metal formed on said land conductor pattern;

superposing the printed substrates one upon another so that the land conductor pattern having the low melting point metal layer of each substrate is in contact with the land conductor pattern or patterns having the low melting point metal layer of at least one adjacent substrate;

applying pressure and heat sufficient for melt-adhering the substrates having the low melting point metal layer to the at least one adjacent substrate, so that there is a space between the signal conductor pattern and the adjacent substrate; and

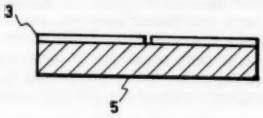
boring through holes in the substrate and the melt-adhered land conductor patterns of the superposed substrates, and forming plated conductor layers on at least the inner walls of the through holes to form plated through holes serving as an electrical connection between at least two signal conductor patterns of the superposed printed substrates.

4,528,073
METHOD FOR MANUFACTURING MULTICOLORED PLATE, MULTICOLORED FILTER AND MULTICOLORED DISPLAY DEVICE

Yutaka Sano; Koji Iwasa; Hitoshi Kamamori; Mitsuru Suginoya, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,946
Claims priority, application Japan, Dec. 22, 1982, 57-233931; Dec. 22, 1982, 57-233932
Int. Cl.³ C25D *11/24*
U.S. Cl. 204—15 **14 Claims**

3. A method of manufacturing a multicolor display device comprising the steps of: providing first and second substrates; forming a pattern of separate groups of display electrodes on a surface portion of the first substrate; forming aluminum films on the display electrodes; electrolytically oxidizing the aluminum films on the display electrodes of one group to convert the same to oxidized aluminum films; dyeing the oxidized aluminum films with a dye of one color tone to obtain one group of display electrodes having oxidized aluminum films dyed in one color tone; successively repeating the electrolytically oxidizing and dyeing steps using other groups of display electrodes and dyes of different color tones to obtain other groups of display electrodes having oxidized aluminum films dyed in

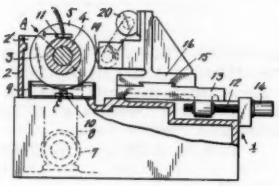


different color tones such that each separate display electrode group has a dyed color tone different from the others; forming a counter electrode pattern on a surface portion of the second substrate; disposing the first and second substrates in opposed spaced-apart relation with the pattern of display electrode groups oppositely facing the counter electrode pattern; and confining a display material in the space between the spaced-apart first and second substrates.

4,528,074
METHOD FOR PRODUCING A GRINDING WHEEL BY ELECTROPLATING

Masakazu Miyashita, Kokubunji; Akira Kanai, Higashiyamato; Junichi Yoshioka, Chiba; Koichi Koizumi, Matsudo; Fukuo Hashimoto, Hachioji; Michimasa Daito, and Takashi Hasebe, both of Hamamatsu, all of Japan, assignors to Nissin Machine Works, Limited, Hamamatsu, Japan

Filed Mar. 1, 1984, Ser. No. 585,293
Claims priority, application Japan, Mar. 2, 1983, 58-34185
Int. Cl.³ C25D *15/00*
U.S. Cl. 204—16 **8 Claims**



1. The method of producing a grinding wheel comprising the steps of:

providing a grinding wheel having an integral grinding wheel body and sleeve, said sleeve having a bore to provide a predetermined rotation reference surface,

applying a first layer having plastic deformation to a grinding wheel body,

adhering abrasive grains to said first layer to temporarily fix said abrasive grains,

applying a second layer having plastic deformation to partially cover said grains,

obtaining a substantially uniform height of projection of said abrasive grains relative to said rotation reference surface by feeding a rotating pressing roller into pressure contact with said abrasive grains after said step of applying said second layer, said abrasive grains thereby being forced to move into said first layer and within said second layer through making effective use of the plastic deformation of said layers.

4,528,075

SOLUBILIZATION OF BENZYLIDENE ACETONE IN ZINC ELECTROPLATING BATHS

Michael J. Anchor, Canton Township, Wayne County, and Ronald L. Camp, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 7, 1984, Ser. No. 648,319
Int. Cl.³ C25D *3/22*
U.S. Cl. 204—55 R **36 Claims**

1. An aqueous electroplating bath for depositing zinc comprising zinc ions, benzylidene acetone, and an oxyalkylene compound which is a cogeneric mixture of conjugated polyoxyalkylene compounds containing in their structure C_3–C_5 oxyalkylene groups, oxyethylene groups and the nucleus of a Bisphenol compound containing a plurality of reactive hydrogen atoms.

4,528,076

ELECTROCHEMICAL OXIDATION SYNTHESIS OF BIS-(5,5') -8 -ANILINO -1-NAPHTHALENE SULFONATE (BIS-ANS)

Henry E. Gossage, 6862 Skillman St., Apt. #151, Dallas, Tex. 75231

Filed Nov. 1, 1984, Ser. No. 667,325
Int. Cl.³ C25B *3/02*
U.S. Cl. 204—78 **15 Claims**

1. An electrochemical oxidation synthesis process for production of bis-Naphthylamine products comprising: the use of an electrochemical system including container means containing an aqueous solution, a carbon material anode, extending into the solution in said container, an electrially conductive metal cathode extended into the solution in said container, stirring means for stirring the solution, and a D.C. power supply, with D.C. voltage level adjustment means, having positive terminal connection means to said carbon material anode and negative terminal connection means to said metal cathode; charging said aqueous solution with a naphthylamine; increasing the D.C. voltage level of said D.C. power supply with said D.C. voltage level adjustment means until current begins to flow between said anode and cathode electrodes and then continuing electrolyzation period through a period of time to reasonable completion of the process.

4,528,077

MEMBRANE ELECTROLYTIC CELL FOR MINIMIZING HYPOCHLORITE AND CHLORATE FORMATION

David L. Fair, Chattanooga; David D. Justice, and Kenneth E. Woodard, Jr., both of Cleveland, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jul. 2, 1982, Ser. No. 394,964
Int. Cl.³ C25B *1/26, 1/34, 11/03, 11/10*
U.S. Cl. 204—95 **7 Claims**

1. A process for electrolyzing an alkali metal chloride brine in which low concentrations of hypochlorite ion and chlorate ion are formed which comprises:

(a) feeding said alkali metal chloride brine to an electrolytic cell comprised of an anode compartment and a cathode compartment separated by a cation exchange membrane; an anode positioned in said anode compartment and in contact with said alkali metal chloride brine, said anode comprised of an unflattened expanded structure of a valve metal selected from the group consisting of titanium, tantalum, niobium, and alloys thereof, at least one side of said anode having as the electrochemically active surface an electrodeposited layer of a valve metal oxide, a plurality of cracks traversing said electrodeposited layer, a coating of a platinum metal group oxide on said electrodeposited layer and substantially filling the cracks; said cationic exchange membrane comprised of a laminated structure having a first surface in contact with said alkali metal chloride brine in which the ion exchange groups are predominately sulfonic acid groups, the first surface being in contact with the electrochemically active surface of said anode, and a second surface contacting a catholyte in which the ion exchange groups are predominately carboxylic acid groups, and a cathode positioned in the cathode compartment and spaced apart from the cation exchange membrane;

(b) electrolyzing said alkali metal chloride brine to produce in said anode compartment chlorine gas;

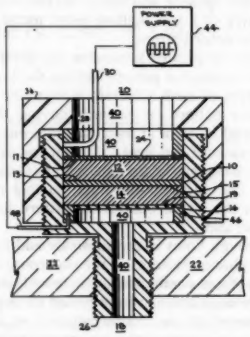
(c) recovering from said anode compartment chlorine gas and spent alkali metal chloride brine, said spent alkali metal chloride brine having a hypochlorite ion concentration of less than about 0.5 grams per liter.

4,528,078

NONSATURABLE MICRODRYER

Tomas B. Hirschfeld, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 23, 1984, Ser. No. 612,954
Int. Cl.³ C25B *1/04*
U.S. Cl. 204—129 **13 Claims**



12. A method of dehumidifying a sealed container comprising the steps of:

(a) providing a channel between the exterior and interior of the sealed container;

(b) electrolytically transforming water into hydrogen and oxygen by an electrode/electrolyte assembly disposed inside the channel, the electrode/electrolyte assembly having a hygroscopic electrolyte;

(c) selectively removing a portion of the hydrogen gas generated by the electrode/electrolyte assembly from the interior of the sealed container and selectively inhibiting the influx of water from the exterior of the sealed container to the interior of the sealed container by a semipermeable membrane, the semipermeable membrane being disposed in the channel between the electrode/electrolyte assembly and the exterior of the sealed container; and

(d) catalytically transforming hydrogen generated by the electrode/electrolyte assembly and diffusing toward the interior of the sealed container back into water by a catalytic layer disposed inside the channel betwenn the elec-

trode/electrolyte assembly and the interior of the sealed container, a portion of said water formed by the catalytic layer being re-absorbed by the hygroscopic electrolyte of the electrode/electrolyte assembly where said water is electrolytically transformed into hydrogen and oxygen.

4,528,079

METHOD OF MITIGATING BOUNDARY FRICTION AND WEAR IN METAL SURFACES IN SLIDING CONTACTS

Philip O. Badger, South Bend, Ind., assignor to Miracle Metals, Inc., Denver, Colo.

Filed May 25, 1983, Ser. No. 497,890

Int. Cl.[3] **C25F** *3/00;* **B21D** *53/10;* **F16C** *13/00;* **B21B** *45/02*

U.S. Cl. 204—129.1 **10 Claims**

1. A method of forming a metal contact surface for sliding engagement with another surface, said method comprising:

(a) treating said metal surface to form a plurality of metallic crystalline projections thereon with the areas between said projections penetrating the substrate of said metal surface and constituting reservoir means therein for containing a solid lubricant;

(b) applying a solid lubricant to the resulting treated surface to fill said reservoir means; and

(c) causing said crystalline projections to be bent over said reservoirs to entrap said sold lubricant within the reservoirs by applying gradually increasing pressure on said metal surface so that said crystalline projections are bent relative to the remainder of said metal surface.

5. The method of claim 1 wherein step (a) includes immersing said metal surface in a bath of a strong acid while simultaneously passing an electrolytic current through said bath.

4,528,080

PHOTOCHEMICAL METHOD FOR THE SEPARATION OF MIXTURES OF XENON AND KRYPTON

Terence Donohue, Alexandria, Va., and Christine E. Geosling, Moorpark, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1984, Ser. No. 605,966

Int. Cl.[3] **B01J** *19/12*

U.S. Cl. 204—157.1 R **20 Claims**

1. A method of separating xenon from a mixture comprising xenon and krypton, the steps of which comprise:

selecting a light source;

irradiating a gaseous mixture comprising xenon, krypton and fluorine with light from said light source at a wavelength of 250–370 nm to form crystals of XeF_2;

decomposing said crystals of XeF_2 to form xenon and fluorine gas;

isolating xenon.

4,528,081

DUAL CURING SILICONE, METHOD OF PREPARING SAME AND DIELECTRIC SOFT-GEL COMPOSITIONS THEREOF

Qcheng S. Lien, South Windsor, and Steven T. Nakos, East Hartford, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Oct. 3, 1983, Ser. No. 538,624

Int. Cl.[3] **C08F** *2/46*

U.S. Cl. 204—159.13 **11 Claims**

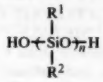
1. A composition capable of curing by both moisture cure and UV cure mechanisms, the composition comprising:

(a) 30–100 parts by weight of a reactive polyorganosiloxane terminated with acrylic functional dialkoxy- or diaryloxysilyl groups and containing about 0.1–5% of a silicone moisture curing catalyst;

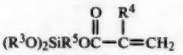
(b) 0–70 parts by weight of a trimethylsilyl-terminated silicone oil; and

(c) an effective amount of a photosensitizer, said photosensitizer present either as photosensitive groups bound to said reactive polyorganosiloxane or as a separate ingredient in admixture with components (a) and (b) above,

wherein the reactive polyorganosiloxane comprises the reaction product of a silanol terminated silicone represented by the formula:



wherein R^1 and R^2 are organo groups, no more than 2% of which are crosslinkable under UV or moisture cure conditions, and n is an integer, said silanol having a viscosity of between about 600 and 20,000 cst, with an acrylic functional trialkoxy- or triaryloxysilane of the formula:



wherein R^3 are the same or different alkyl or aryl groups; R^4 is H or C_{1-5} alkyl and R^5 is alkylene, in the presence of a condensation catalyst, the mole ratio of said silane to said silanol being between 2:1 and 6:1, and the reaction including removing substantially all of the theoretical amount of R^3OH produced by the reaction.

4,528,082

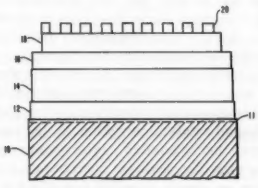
METHOD FOR SPUTTERING A PIN AMORPHOUS SILICON SEMI-CONDUCTOR DEVICE HAVING PARTIALLY CRYSTALLIZED P AND N-LAYERS

Theodore D. Moustakas, and H. Paul Maruska, both of Annandale, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 26, 1983, Ser. No. 535,901

Int. Cl.[3] **C23C** *15/00;* **H01L** *31/18*

U.S. Cl. 204—192 S **26 Claims**



1. A method for producing an amorphous silicon PIN semiconductor device having partially crystallized microcrystalline P and N-layers comprising:

providing a substrate having at least a surface region comprising an electroconductive material which forms an ohmic contact to doped microcrystalline silicon;

reactively RF diode sputtering a layer of microcrystalline silicon doped with one type of charge carrier in partial pressures of hydrogen, ranging from about 20 mTorr to about 80 mTorr, and argon ranging from about 3 mTorr to about 10 mTorr onto at least said surface region of the substrate;

reactively RF diode sputtering a layer of amorphous intrinsic, I, silicon onto said layer of silicon doped with said one type of charge carrier;

reactively RF diode sputtering a layer of microcrystalline silicon doped with the opposite type of charge carrier in partial pressures of hydrogen, ranging from about 20 mTorr to about 80 mTorr, and argon ranging from about 3 mTorr to about 10 mTorr onto said I layer;

sputtering an electroconductive material onto at least a

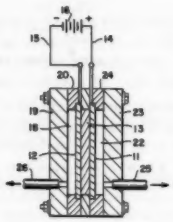
region of said layer of microcrystalline silicon doped with said opposite type of charge carrier which material forms an ohmic contact thereto.

4,528,083

DEVICE FOR EVOLUTION OF OXYGEN WITH TERNARY ELECTROCATALYSTS CONTAINING VALVE METALS

Anthony B. LaConti, Lynnfield; John F. Enos, Peabody; Russell M. Dempsey, Hamilton, and Anthony R. Fragala, N. Andover, all of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 485,157, Apr. 15, 1983, abandoned.
This application Mar. 23, 1984, Ser. No. 592,662
Int. Cl.³ C25B *9/00, 11/06, 11/08*
U.S. Cl. 204—265 **2 Claims**



1. Apparatus for the evolution of oxygen and protons by electrolysis of an oxygen containing compound whereby gaseous oxygen and gaseous hydrogen are produced in said apparatus comprising:

a catalytic cathode;

a catalytic oxygen evolving anode comprising a ternary catalyst of a first platinum group metal compound, a second platinum group metal compound and a valve metal containing compound, wherein said valve metal containing compound comprises about ½ percent to about 50 percent by weight, the first platinum containing compound comprises about 5 percent to about 25 percent by weight, and the second platinum group metal compound comprises the remainder of said ternary catalyst;

an ion exchange membrane for dividing the apparatus into anode and cathode chambers, said membrane being disposed between and in electrical contact with the catalytic cathode and catalytic oxygen evolving anode, the cathode and anode being bonded to the membrane;

means for providing a direct current potential to said anode whereby an anodic potential is applied to the anode containing the oxygen evolving ternary catalyst;

means for continuously introducing an oxygen evolving compound to the anode chamber to evolve gaseous oxygen and protons in an electrolysis reaction, and

means for providing a direct current potential to the cathode whereby a cathodic potential is applied to the cathode thereby causing transport of said protons across said membrane to evolve gaseous hydrogen at the cathode.

4,528,084

ELECTRODE WITH ELECTROCATALYTIC SURFACE

Henri B. Beer, Heide Kalmthout, Belgium, and Jean M. Hinden, Chambesy, Switzerland, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 293,136, Aug. 17, 1981, abandoned.
This application Jun. 23, 1983, Ser. No. 507,937
Claims priority, application United Kingdom, Aug. 18, 1980, 8026832; Mar. 4, 1981, 8106830
Int. Cl.³ C25B *11/00;* **C25C** *7/02*
U.S. Cl. 204—290 F **30 Claims**

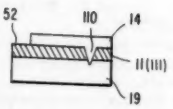
1. In an electrode for use in electrocatalytic processes comprising a base of a film-forming metal with an operative electrocatalytic outer surface formed as an integral surface film of the film-forming metal base incorporating therein a platinum-group metal or compound thereof as electrocatalyst, the improvement comprising said electrocatalytic outer surface is formed by a surface treatment by applying to the surface of the film-forming metal base at least one layer of a solution of at least one thermodecomposable compound which consists essentially of a platinum-group metal compound, drying and heating each applied layer to decompose said compound in a similar manner to methods known per se for the formation of platinum-group metal and platinum-group metal oxide coatings, wherein said solution contains a halide agent which attacks the film-forming metal base and converts metal from the base into ions which are converted into a compound of the film-forming metal during the heating step, and wherein the concentration of said halide agent in the solution, the concentration of the platinum-group metal compound(s) in the solution, the drying, the heating and the number of applied layers are such that during the heating of each layer including the last layer, the electrocatalyst formed from the decomposed platinum-group metal compound is incorporated fully in a simultaneously-formed surface film of film-forming metal compound grown up from the base as a result of said halide agent attacking the film-forming metal base thereby forming an electrolytic outer surface, said outer surface being the surface film of film-forming metal compound integral with and wholly containing the electrocatalyst formed from the decomposed platinum-group metal compound.

4,528,085

ION SELECTIVE ELECTRODE AND PROCESS OF PREPARING THE SAME

Masao Kitajima; Osamu Seshimoto, both of Saitama, and Shigemitsu Mizutani, Kanagawa, all of Japan, assignors to Fuji Photo Film Company, Ltd., Saitama, Japan

Filed Mar. 15, 1983, Ser. No. 475,672
Claims priority, application Japan, Mar. 15, 1982, 57-40398
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—416 **18 Claims**



1. An ion selective electrode comprising a support having provided thereon, in sequence, a conductive layer and a substantially electrically insulating ion selective layer,

said conductive layer having at least one groove therethrough, and,

the surface of said groove being covered with said ion selective layer.

4,528,086

OXYGEN SENSOR WITH HEATER

Nobuhide Kato, Aichi, and Takao Murase, Konan, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 27, 1984, Ser. No. 604,474
Claims priority, application Japan, May 9, 1983, 58-68665[U]
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—427 **5 Claims**

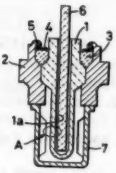
1. An oxygen sensor comprising:

a tubular body of solid electrolyte having an elongate bore which is closed at one end of said tubular body and open at the other end, and further having reference and measuring electrodes on inner and outer surfaces thereof, respectively;

a housing supporting said tubular body such that said outer surface thereof is exposed at said one end to exhaust gas,

said housing maintaining said elongate bore in gas-tight condition with respect to said exhaust gas; and

a bar-shaped heater inserted in said elongate bore in said tubular body, and comprising a heating resistor connected to an electric power source having a positive temperature coefficient, a ceramic body carrying said heating resistor so as to embed the heating resistor, and a pair of lead wires for connecting said heating resistor to an electric power source,



said ceramic body having on its outer peripheral surface a pair of terminal pads connected to said heating resistor, an end portion of each of said lead wires being brazed to corresponding one of said terminal pads with a brazing material containing silver, said ceramic body further having on said outer peripheral surface a pair of equipotential members disposed outwardly of said pair of terminal pads, respectively, said equipotential members enclosing at least portions of the peripheries of the corresponding terminal pads which are opposite to each other.

4,528,087

PROCESS FOR PRODUCING MESOPHASE PITCH

Haruo Shibatani; Kunimasa Takahashi, and Takashi Kameda, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,337

Claims priority, application Japan, Mar. 9, 1982, 57-36804; Mar. 10, 1982, 57-37509

Int. Cl.³ C10C *3/00*

U.S. Cl. 208—22 **8 Claims**

1. A process for producing mesophase pitch wherein about 40% or more of the mesophase in said pitch is quinoline soluble mesophase, which consists of heating a pitch having an aromatic hydrogen content of 50–90% at a temperature in the range of 430°–550° C. while passing an inert gas thereover until at least 40% of mesophase is formed.

4,528,088

COKING WITH SOLVENT SEPARATION OF RECYCLE OIL USING COKER NAPHTHA AND SOLVENT RECOVERY

Bong H. Chang, Summit, and Joseph M. Ritchie, Morristown, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 30, 1983, Ser. No. 556,285

Int. Cl.³ C10G *21/06, 55/04*

U.S. Cl. 208—96 **14 Claims**

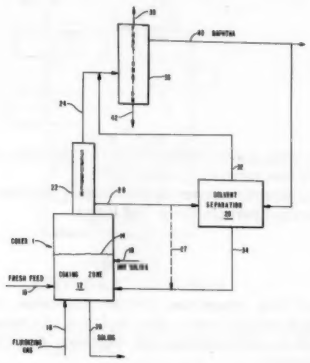
1. A coking process comprising the steps of:

(a) coking a carbonaceous chargestock in a coking zone at coking conditions to produce coke and vapor phase product, including heavy and light normally liquid hydrocarbons;

(b) separating at least a portion of said heavy hydrocarbons from said vapor phase product, said separated hydrocarbons having a Conradson carbon content ranging from about 5 to about 50 weight percent;

(c) subsequently contacting at least a portion of said separated heavy hydrocarbons with coker naphtha in a solvent separation zone at solvent separation conditions, including a volumetric ratio of said solvent to said portion of separated heavy hydrocarbons ranging from about 0.5:1 to 10:1, to separate said heavy hydrocarbons into a high Conradson carbon hydrocarbonaceous product comprising a minor portion of said coker naphtha and a lower Conradson carbon hydrocarbonaceous product comprising a major portion of said coker naphtha;

(d) recycling at least a portion of said high Conradson carbon hydrocarbonaceous product comprising said minor portion of coker naphtha to said coking zone;



(e) separating at least a portion of said low Conradson carbon hydrocarbonaceous product comprising said major portion of coker naphtha in a fractionation zone wherein at least a portion of said vapor phase product of step (a) is separated;

(f) recovering a naphtha fraction from said fractionation zone, and

(g) recovering the remaining constituents of said low Conradson carbon hydrocarbonaceous product from said fractionation zone.

4,528,089

HYDROGENATION PROCESSES USING CARBON-CONTAINING MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS

Theresa A. Pecoraro, Danville, Calif., and Russell R. Chianelli, Somerville, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 399,999, Jul. 20, 1982, abandoned. This application Nov. 16, 1983, Ser. No. 552,403

Int. Cl.³ C10G *45/04*

U.S. Cl. 208—216 R **29 Claims**

1. A process for upgrading hydrocarbon feeds comprising contacting said feed, at hydrotreating conditions and in the presence of hydrogen, with a catalyst comprising a poorly crystalline, carbon-containing metal sulfide having the formula $MS_{2-z}C_{z'}$ wherein $0.01 \leqq z \leqq 0.5$ and $0.01 \leqq z' \leqq 3.0$ and wherein M is a metal selected from the group consisting of Mo, W and mixtures thereof.

4,528,090

OIL SHALE BENEFICIATION BY SIZE REDUCTION COMBINED WITH HEAVY MEDIA SEPARATION

Tien-Fung Tsui, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,821

Int. Cl.³ B03B *9/02*

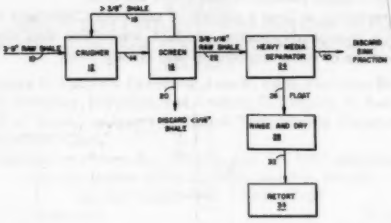
U.S. Cl. 209—2 **16 Claims**

1. A method for enriching raw oil shale or other similar oil containing materials comprising:

(a) crushing and pulverizing raw oil shale to a small particle

size including relatively smaller, mineral rich, oil lean particles and larger, oil rich particles;

(b) floating said larger particles in a non-polar liquid which



specific gravity causes the oil rich particles to float and the oil lean particles to sink; and

(c) separately recovering the floating particles and the submerged particles from said liquid.

4,528,091

PARTICLE CLASSIFIER

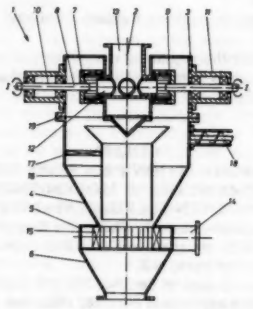
Roland Nied, Bonstetten; Herbert Horlamus, Augsburg, and Fritz Kaiser, Neusaess, all of Fed. Rep. of Germany, assignors to Alpine Aktiengesellschaft Augsburg, Augsburg, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,686

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303078

Int. Cl.³ B07B *7/08*

U.S. Cl. 209—139 R **9 Claims**



1. A particle classifier comprising:

(a) a casing having

(i) a classification chamber defining a vertical axis, and

(ii) a tapering bottom part and a cylindrical top part;

(b) air inlet means secured to said bottom part of the casing at the bottom thereof for supplying air thereto having

(i) a container with an inlet conduit being in fluid communication with the classification chamber, and

(ii) a plurality of guide blades secured within the container and forming a blade ring concentric with the vertical axis of the classification chamber;

(c) means for supplying particulate material to be classified into the bottom part of said classification chamber of said casing and at a location above said air inlet means;

(d) a particle separating means mounted in the top part of the classification chamber having

(i) at least two separating wheels of same shape and size, each wheel being mounted for rotation about its axis and including a multitude of blades positioned about the circumference of the wheel, extending parallel to its axis, and forming a multitude of openings for conducting air and fine particles entrained therewith into the interior of the separating wheel, and

(ii) means connected to the separating wheels for rotating the separating wheels; and

(e) discharge conduit means in communication with the interiors of the separating wheels for discharging from the classification chamber air and fine particles passing between the blades of the separating wheels and into the interiors thereof.

4,528,092

AIR CLASSIFIER

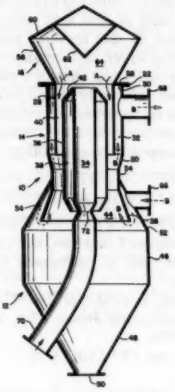
Wolfgang Krambrock, and Hans Hoppe, both of Vogt, Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 463,047

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1982, 3203209

Int. Cl.³ B07B *11/06, 4/02*

U.S. Cl. 209—139 R **3 Claims**



1. An air classifier comprising an upright housing open at both ends, a cylindrical pipe section having means concentrically locating said pipe section within the upper end of said housing and defining therewith a first annular passage closed at its upper end, a cylindrical feed conduit for attachment to pneumatic delivery system for bulk material to be separated extending upwardly and concentrically within said pipe section and defining therewith a second annular passage of constant width open at both ends, a cover mounted on the upper end of said housing defining above said feed conduit and said second annular passage a chamber for dispersing bulk material emerging from the upper end of said feed conduit, said cover comprising a dome shaped enclosure, having an upwardly and outwardly flaring lower section secured to said housing radially exterior of said second annular passage, an upwardly and inwardly flaring upper section and a conical deflecting member mounted on the interior surface of the upwardly an inwardly flaring upper section of the enclosure concentric with said pipe sections in opposition to the upper end of said feed conduit and said feed conduit having a narrowed end section at the point of connection with said pneumatic delivery means to restrict entry into said feed conduit, said feed conduit projecting beyond the lower end of said pipe section and defining with said housing a separating chamber for separating the component parts of said bulk material communicating with said first and second passages, a container for receiving a separated portion from said separating chamber, mounted on said housing and extending below said annular separation chamber, inlet means for supplying classifying air to said separating chamber,

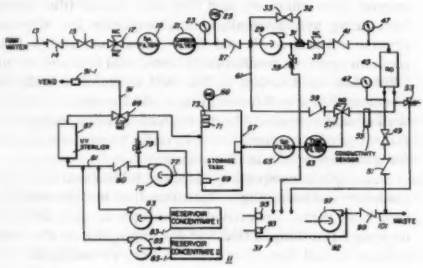
and outlet means for withdrawing said classifying air from said first annular passage.

4,528,093

METHOD AND APPARATUS FOR PURIFYING AND DISPENSING WATER

Steven Winer, Boston, Mass., assignor to Water Marketers, Inc., Boston, Mass.

Filed Aug. 15, 1983, Ser. No. 523,200
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—96.2 **2 Claims**



1. In an apparatus for purifying and dispensing water the combination comprising:

a. a flow line having an inlet connected to a source of raw water,

b. filter means connected to the flow line for filtering said water,

c. a reverse osmosis unit having a feed water inlet, a permeate outlet, a membrane and a concentrate outlet,

d. a reverse osmosis pump having its inlet end connected to the outlet end of the filter means,

e. a storage tank,

f. valve means having an inlet end coupled to the permeate outlet of the reverse osmosis unit, an outlet connected to an inlet of the storage tank and an outlet connected to the inlet of the reverse osmosis pump,

g. a conductivity sensor coupled between the valve means and the permeate outlet of the reverse osmosis unit for sensing the quality of the water emitted through the permeate outlet of the reverse osmosis unit and controlling the valve means so that the water passes either to the reverse osmosis unit pump or the storage tank and

h. means for dispensing water from the storage tank,

i. said means for dispensing water from the storage tank comprising:

i. outlet means,

ii. a continuously operating distribution pump having an inlet end connected to an outlet on the storage tank and an outlet,

iii. an ultraviolet sterilizer coupled to the outlet end of the distribution pump,

iv. valve means coupled to the outlet end of the ultraviolet sterilizer, the outlet means and an inlet on the storage tank,

v. means for selectively adding a first solution of minerals to the water being dispensed to enhance its taste, and

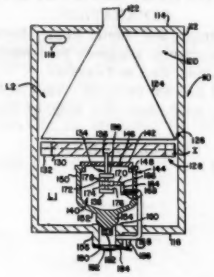
vi. means for selectively adding a second solution of electrolytes to the water being dispensed to provide a water mixture that will rapidly replenish electrolytes lost by a person during athletic or other strenuous activity.

4,528,094

SEPARATION OF TWO LIQUIDS

Edgar P. Scragg, 60 Mulder St., Florida Park Extn. 3, Florida, Transvaal Province, South Africa

Filed Jul. 29, 1982, Ser. No. 403,266
Claims priority, application South Africa, Aug. 6, 1981, 81/5416; Nov. 30, 1981, 81/8295
Int. Cl.³ B01D *21/24*
U.S. Cl. 210—114 **18 Claims**



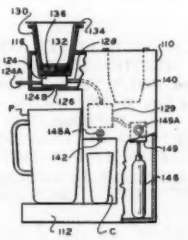
1. A device for separating two liquids, the device comprising a float chamber having an inlet with the inlet arranged so that liquid flowing into the chamber through the inlet swirls in the chamber, a float in the float chamber, the float being free to rotate and being such that it sinks in the lighter of the liquids to be separated but floats in the heavier of the liquids, an outlet from the device, a normally closed valve for controlling flow through said outlet, a valve operating member for opening and closing the valve, and first and second engagement surfaces, the first engagement surface being on the float, and rotating therewith and the second engagement surface being on the valve operating member, and at least one of said surfaces being in the form of a ramp which is engaged and repeatedly struck by the other of said surfaces as the float rotates after rising due to an accumulation of the heavier liquid at the bottom of said chamber whereby said valve operating member is displaced to open said valve.

4,528,095

FILTERING SYSTEM FOR POTABLE WATER

James J. Byrne, 322 Adolphus Ave., Cliffside Park, N.J. 07010

Filed Jan. 27, 1983, Ser. No. 461,448
Int. Cl.³ B01D *27/02*
U.S. Cl. 210—206 **12 Claims**



1. A filtering system for potable water, comprising:

a removable basket having on its bottom means defining a central aperture;

a filtering sheet lining the inside of said basket, said filtering sheet being formed into a flexible envelope;

activated charcoal granules disposed within said envelope for filtering potable water; and

a stand having an upper cantilevered branch with means defining an opening sized to hold said basket, said basket being detachably mounted in said opening, said stand being arranged to allow water to flow through said granules without standing, said stand being openly structured to allow air drying of said granules.

4,528,096

DEVICE FOR HIGH GRADIENT MAGNETIC SEPARATION

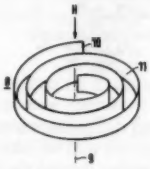
Hans Pfister, Erlangen, and Günter Rupp, Marloffstein, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,989

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929468

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—222 **12 Claims**



1. In a device for the high gradient magnetic separation of magnetizable particles from a flowing medium including an ordered filter structure which contains parts of magnetic material of a predetermined coercitive field strength H_c disposed between the ends of two pole pieces of a magnetic device in a magnetic field which is directed substantially parallel or antiparallel to the flow direction of the medium, with said parts arranged at least approximately perpendicular with respect to the magnetic direction with respect to the direction of the magnetic field, an improved filter comprising glass-like flat ribbons of a soft magnetic amorphous alloy, with a thickness of less than 100 μm, said soft magnetic amorphous alloy having a coercitive field strength H_c of less than 0.2 Oe, said ribbons wound in a spiral about an axis parallel to the direction of the magnetic field and disposed so that their longitudinal axes and the normals of their flat sides are oriented at least approximately perpendicularly with respect to the direction of the magnetic field, to thereby establish high field gradients in said device.

4,528,097

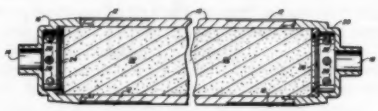
SYMMETRICAL FLUID FILTER APPARATUS WITH MULTIFACETED BEADS

Raymond E. Ward, 1905 N. Val Vista, Mesa, Ariz. 85205

Filed Sep. 30, 1982, Ser. No. 430,799

Int. Cl.³ B01D *35/24*

U.S. Cl. 210—353 **1 Claim**



1. A filter apparatus for removing contaminants from a flow of fluid, comprising:

a cylindrical body;

a first cap having a first aperture therein coupled to one end of said cylindrical body, said first cap being equipped with external thread means surrounding said first aperture for coupling said filter apparatus into a fluid flow line;

a second cap having a second aperture therein coupled to a second end of said cylindrical body, said second cap being equipped with external thread means surrounding said second aperture for coupling said filter apparatus into a second fluid flow line;

filter means disposed within said cylindrical body and restrained by said first and second caps for filtering said fluid, said filter apparatus being symmetrical so that said fluid may flow in either direction through said filter apparatus, the orientation of said filter means being capable of being reversed for assisting in removing contaminants and producing greater filter efficiency in order to substantially extend the life of said filter apparatus, said filter means comprising a first filter operably positioned within said first cap for forming a first filter chamber, a second filter operably positioned within said second cap for forming a second filter chamber, said first and second filter chambers being symmetrically interchangeable for allowing reverse operation of said filter apparatus, and a filter medium operably positioned between said first and second filters and constrained within said cylindrical body between said first and second filters and the intercylindrical wall of said cylindrical body, each of said first and second filters including a rigid frame in order to provide support for a woven micronic filter element;

first cleaning means operably disposed within said first filter chamber and including at least one first mobile multifaceted bead means for providing multiple corners for both increased tumbling action and for impinging on the outer surface of said first filter under a very moderate flow of fluid to prevent the accumulation of contaminants thereon while said first aperture serves as both an inlet and an outlet for said filter apparatus, each of said at least one first mobile multifaceted bead means being constrained within said first filter chamber, each of said at least one first mobile multifaceted bead means being formed from a material having a density incrementally greater than that of the fluid being filtered;

second cleaning means operably disposed within said second filter chamber and including at least one second mobile multifaceted bead means for providing multiple corners for both increased tumbling action and for impinging on the outer surface of said second filter under a very moderate flow of fluid to prevent the accumulation of contaminants thereon while said second aperture serves as both an inlet and an outlet for said filter apparatus, each of said at least one second mobile multifaceted bead means being constrained within said second filter chamber, each of said at least one second mobile multifaceted bead means being formed from a material having a density incrementally greater than that of the fluid being filtered; and

each of said at least one first and second mobile multifaceted bead means having more than six facets.

4,528,098

SCREW DRIVEN SLUDGE THICKENERS

Georges M. Treyssac, Marcq En Baroeul, and Robert Morawek, Mons En Baroeul, both of France, assignors to Societe Anonyme D'Etudes, de Recherches et de Productions D'Agents Chimiques - E.R.P.A.C., Paris, France

Filed Jan. 26, 1984, Ser. No. 573,880

Claims priority, application France, Feb. 2, 1983, 8301646

Int. Cl.³ C02C *3/00*

U.S. Cl. 210—414 **5 Claims**

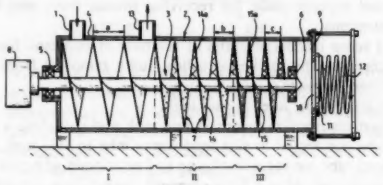
1. An apparatus for thickening a suspension of solid particles in a liquid such as a sludge comprising

a cylindrical enclosure;

a rotary endless screw extending longitudinally in said enclosure,

said enclosure having an inlet for suspension to be thickened, a first outlet for thickened suspension near the front end of

said screw and a second outlet for liquid separated during the thickening; and



means on said screw for causing a higher coefficient of friction on the front, thrust faces of the threads of said screw than on the rear faces thereof.

4,528,099

FILTER MEDIUM FOR FILTERING MOLTEN METALS

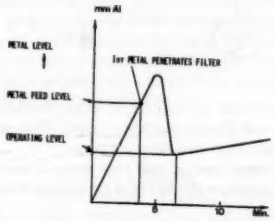
Wolfhart Rieger, Buch; Lugwig Gauckler, Schaffhausen; Konrad Kampfer; Albert Mauer, both of Thayngen; Marco Dellapina, Uhwiesen, and Volker Nobbe, Dachsen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 6, 1983, Ser. No. 501,381

Claims priority, application Switzerland, Jun. 10, 1982, 3586/82

Int. Cl.³ C04B *21/00*

U.S. Cl. 210—489 **9 Claims**



1. A filter medium in the form of a stable body of ceramic material for filtering molten metal comprising at least a first filtering layer A and a second filtering layer B arranged one after the other in the direction of filtration, said at least first filtering layer A having a thickness d_A of between 9–91 mm, porosity f_A of between 0.25–0.8 and pore diameter λ_A of between 0.5–2 mm wherein the parameter H_{SA} of layer A which is proportional to the filtering resistance of layer A is equal to

$$\frac{d_A}{\lambda_A^2 f_A}$$

and has values of between 28–14,560 cm^{-1}, said at least second filtering layer B having a thickness d_B of between 1–33 mm, porosity f_B of between 0.25–0.5 and pore diameter λ_B of between 0.2–1 mm wherein the parameter H_{SB} of layer B which is proportional to the filtering resistance of layer B is equal to

$$\frac{d_B}{\lambda_B^2 f_B}$$

and has values of between 20–33,000 cm^{-1}, and wherein the ratio of thickness d_A to thickness d_B lies between 9:1 and 3:1, and the ratio of the numerical values of parameters H_{SA} and H_{SB} lies between 1:1.2 and 1:30.

4,528,100

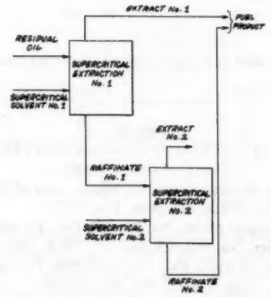
PROCESS FOR PRODUCING HIGH YIELD OF GAS TURBINE FUEL FROM RESIDUAL OIL

Andrew S. Zarchy, Amawalk, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,275

Int. Cl.³ C10G *21/06*

U.S. Cl. 210—634 **3 Claims**



1. A process for the treatment of residual oil comprising the steps of:

treating a feed supply of said residual oil so as to produce a first extract and a first raffinate by supercritical solvent extraction using a first supercritical solvent;

treating said first raffinate so as to produce a second extract and a second raffinate by supercritical solvent extraction using a second supercritical solvent, said treatment of said first raffinate operating to concentrate vanadium present in said residual feed supply in said second extract; and

combining said first extract and said second raffinate.

4,528,101

METHOD OF SEPARATING ACID FROM SALT BY ADSORPTION WITH RECYCLING

Dennis J. Burke, and Robert D. Moore, both of Rockford, Ill., assignors to Illinois Water Treatment Company, Rockford, Ill.

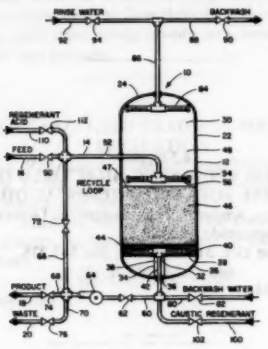
Filed Sep. 9, 1983, Ser. No. 530,975

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—656 **10 Claims**

1. A process for separating a mineral acid from metallic salt comprising the steps of: containing a strong base anion exchange resin in common ion form with a mixture containing a mineral acid and a metallic salt having a common ion, separating by adsorption on said strong base anion exchange resin said mineral acid from said salt into a salt layer, an interface layer and an acid layer, removing the separated salt layer from said

stong base anion exchange resin, recycling said interface layer for further contact with said strong base anion exchange resin,



and removing said acid layer from said strong base anion exchange resin.

4,528,102

CHEMICALLY CLEANING AQUEOUS FLUID OF INSOLUBLE SOLIDS

John E. Oliver, Jr., and Arnold M. Singer, both of Clear Fluids, Inc., P.O. Box 27526, Houston, Tex. 77227

Continuation-in-part of Ser. No. 310,653, Oct. 13, 1981, Pat. No. 4,456,537, Ser. No. 450,519, Dec. 17, 1982, , and Ser. No. 420,140, Aug. 20, 1982, Pat. No. 4,453,598. This application Aug. 8, 1983, Ser. No. 521,187

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[3] **C02F** *1/54*

U.S. Cl. 210—705 **17 Claims**

1. A process for removing insoluble solids consisting of rust, scale, sand, barite, formation particles and drilling mud solids from an aqueous fluid produced in well systems during cleaning operations, comprising:

(a) introducing into the aqueous fluid in a small effective amount of an alcohol with between 5 and 14 carbon atoms and a water insoluble surface active chemical aid; the surface active chemical aid including essentially a surfactant having a molecular weight in the range of 150 to about 500 with predominant hydrophobic characteristics and the surfactant selected from the group consisting of amines, amides and amine oxides wherein the amine, amide and amine oxide have an alkyl group with beteen 8 and 18 carbon atoms;

(b) adjusting the concentration of at least one of the alcohol and surface active chemical aid to control agglomeration of the insoluble solids and then to settle, float or suspend the same in the aqueous fluid; and

(c) in a quiescent separation zone, removing the agglomerated insoluble solids by decantation, flotation or filtration, respectively.

4,528,103

PRESSURE FILTER

Gordon Spilkin, Stamford; Jack H. Eichler, Westport, and Peter Kos, Ridgefield, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 6, 1984, Ser. No. 597,779

Int. Cl.[3] **B01D** *29/24, 29/38*

U.S. Cl. 210—791 **11 Claims**

1. A pressure filter for separating a liquid from a liquid slurry solution and thickening a solids slurry for discharge as underflow from said filter comprising

a. a vertical cylindrical tank,

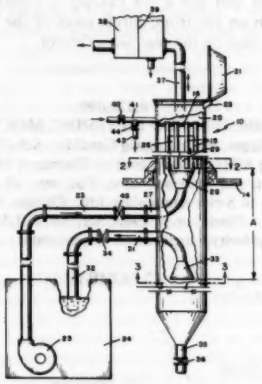
b. a plurality of tubular filter elements suspended in spaced and parallel vertical relationship from one side of a support plate disposed in the upper portion of said tank,

c. a filtrate receiving chamber located at the opposite side of said support plate for receiving filtrate from said filter elements,

d. a sump discharge outlet at the base of said tank for discharging the thickened solids slurry removed from said filter elements,

e. a feed slurry inlet to said tank,

f. feed distribution means in said tank and including a feed tube connected to said feed slurry inlet to said tank, said feed tube having a discharge end positioned adjacent said upper ends of said filter elements spaced from the undersurface of said support plate,



g. means provided to selectively effect backflow of the filtrate in said filtrate chamber to said filter elements to remove cake from said filter elements,

h. a displacement zone in said tank beneath said filter elements for receiving the filter cake removed from said filter elements, and

i. a barometric leg provided in said tank for effecting a vacuum assist during the backflow of filtrate to said filter element and for returning feed slurry to a feed slurry tank during the removal of said filter cake from said filter element through an entry port located in said displacement zone,

j. said displacement zone extending from the lower ends of said filter elements to the entry port to said barometric leg a predetermined distance sufficient to prevent said removed cake from discharging through said entry port.

4,528,104

OIL BASED PACKER FLUIDS

Roy F. House, and Forrest A. Scearce, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,491

Int. Cl.[3] **C09K** *7/06;* **E21B** *36/00, 43/24*

U.S. Cl. 252—8.5 M **40 Claims**

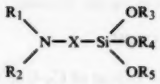
1. An oil base packer fluid comprising a mixture of:

(a) a liquid oleaginous medium;

(b) an organophilic clay comprising the reaction product of an organic onium compound and a smectite clay in an amount effective for gelling said packer fluid;

(c) a polar dispersant for said clay; and

(d) a polyfunctional amino silane represented by the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and alkylaryl; and X is selected from the group consisting of alkylene, arylene, alkarylene, arylalkylene, cycloalkylene, aminoalkylene, aminoarylene, aminoalkylarylene, aminoarylalkylene and aminocycloalkylene, in an amount sufficient to raise the yield temperature of said organophilic clay in said fluid.

4,528,105
MICELLE SOLUTION COMPOSITIONS FOR RECOVERING CRUDE OIL

Hiroshi Ito, Hino; Kyusei Hasegawa, Sagamihara; Takashi Takeuchi, Utsunomiya, and Takayuki Ikenaga, Wakayama, all of Japan, assignors to Teikoku Oil Co., Ltd. and Kao Corporation, both of Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 525,897

Claims priority, application Japan, Sep. 7, 1982, 57-155726

Int. Cl.³ E21B *43/22, 43/24*

U.S. Cl. 252—8.55 D **14 Claims**

1. A micelle solution composition for recovering crude oil from petroleum reservoirs which comprises as essential components, a hydrocarbon, brine, and a surface active agent, wherein said surface active agent is a mixture of (a) an ethylene oxide and propylene oxide block polymer, (b) an alkaline earth metal salt of an alkylbenzenesulfonate, (c) a polyoxyethylene alkyl ether sulfate or polyoxyethylene alkylphenol ether sulfate, and (d) a polyoxyethylene nonionic surface active agent other than the agent specified in (a).

4,528,106
GLUCOSIDE SURFACTANTS

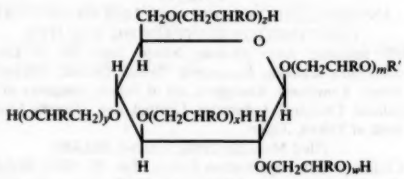
Marilyn A. Grolitzer, Hamden, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Nov. 14, 1983, Ser. No. 551,537

Int. Cl.³ C09K *3/00*

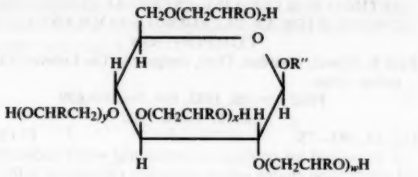
U.S. Cl. 252—8.55 D **12 Claims**

1. A process for preparing a polyalkoxylated glucoside composition of the formula

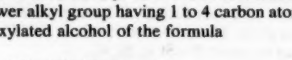


wherein each R is individually selected from the group consisting of a hydrogen and a methyl group; wherein the sum of w+x+y+z is from about 4 to about 40; and wherein m is from about 2 to about 15; and wherein R′ is selected from the group consisting of an alkyl group having about 6 to about 20 carbon atoms, and alkenyl group having about 6 to about 20 carbon atoms and an alkyl aryl group having about 10 to about 20 carbon atoms; said process comprising

reacting in the presence of an effective catalytic amount of acid catalyst at a temperature from about 100° C. to about 150° C. a polyalkoxylated lower alkyl glucoside of the formula

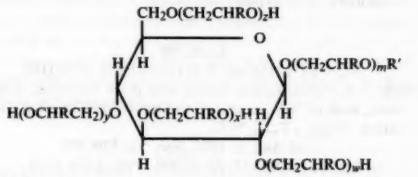


wherein R, w, x, y and z are as defined above and R″ is a lower alkyl group having 1 to 4 carbon atoms with a polyalkoxylated alcohol of the formula



wherein R and R′ are as defined above.

7. A polyalkoxylated glucoside composition comprising the formula



wherein each R is individually selected from the group consisting of a hydrogen and a methyl group; wherein the sum of w+x+y+z is from about 4 to about 40; wherein m is from 2 to about 15; and R′ is selected from the group consisting of an alkyl group having about 6 to about 20 carbon atoms, an alkenyl group having about 6 to about 20 carbon atoms and an alkyl aryl group having about 10 to about 20 carbon atoms.

4,528,107
FROTH FLOTATION

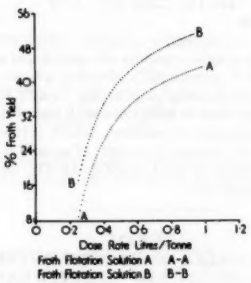
David J. A. McCaffrey, and John P. Sheppard, both of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jul. 27, 1983, Ser. No. 517,656

Claims priority, application United Kingdom, Aug. 3, 1982, 8222408

Int. Cl.³ B03D *1/14*

U.S. Cl. 252—61 **7 Claims**



1. A method of treating minerals by froth flotation comprising the operation of a froth flotation cell using a "collector" consisting essentially of a hydrocarbon liquid having an aromatic content greater than 21% or a naphthenic content greater than 41% by weight.

4,528,108

METHOD FOR COOLING INTERNAL COMBUSTION ENGINE WITH AN OLEAGINOUS COOLANT FLUID COMPOSITION

Kent B. Grover, Chardon, Ohio, assignor to The Lubrizol Corporation, Ohio

Filed Apr. 20, 1983, Ser. No. 486,639

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—75 **17 Claims**

1. A method for cooling a conventional water-cooled internal combustion engine which comprises circulating within the water coolant system of said engine an oleaginous coolant fluid composition essentially free from water and comprising:

(A) a major amount of a lubricating oil having a kinematic viscosity of from about 3.5 up to about 5 cSt at 100° C. and from about 18 up to about 30 cSt at 40° C.;

(B) a minor amount of a composition selected from the group consisting of

(1) one or more basic metal salts of organic acids;

(2) one or more phosphorus containing metal salts;

(3) one or more phenolic antioxidants;

(4) one or more pour point depressants; and mixtures of two or more of (B)(1) through (B)(4).

4,528,109

NON-FLAMMABLE HYDRAULIC FLUIDS

Michael J. Fifolt, Grand Island, and John Forcucci, Niagara Falls, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 3, 1983, Ser. No. 519,940

Int. Cl.³ C09K *15/20;* **C10M** *1/20, 1/26, 3/24*

U.S. Cl. 252—78.1 **7 Claims**

1. A non-flammable hydraulic fluid which is compatible with both acrylonitrile-butadiene rubber seals and fluoroelastomer seals comprises at least about 75% by volume of a fluorinated chlorotrifluoroethylene oil, from about 5% to about 20% by volume of a hydrocarbon oil having a low wax content, from about 1% to about 15% by volume of an aliphatic adipate ester, from about 0.1% to about 10% by volume of a liquid aromatic polyether, and from about 0.001% to about 5% by weight of a phenolic antioxidant.

4,528,110

METHOD OF USING ALKYL MONOPHOSPHORIC ACIDS AS GERMICIDAL AGENTS

Siegfried Bragulla, Monheim, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 22, 1983, Ser. No. 506,597

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240688

Int. Cl.³ C11D *3/48, 3/36*

U.S. Cl. 252—106 **10 Claims**

1. A method of disinfecting a surface which comprises applying thereto an effective amount of a germicidal composition which comprises a germicidally effective amount of at least one alkyl monophosphonic acid having from 4 to 12 carbon atoms in the alkyl chain in admixture with one or more anionic or nonionic surfactants in solution, which solution contains from about 0.1 to 2 percent by weight of an acid selected from the group consisting of HCl, H_2SO_4, HNO_3, amidosulfonic acid and phosphoric acid.

4,528,111

SHAVING CREAM GEL CONTAINING INTERPOLYMER REACTION PRODUCT OF SELECTED CATIONIC POLYMERS AND ANIONIC POLYMERS

Dean T. Su, North Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,591

Int. Cl.³ C11D *1/02, 1/38;* **A61K** *7/06, 31/74*

U.S. Cl. 252—107 **13 Claims**

1. A stable shaving cream gel comprising 55% to 94% by weight of water; 4% to 30% by weight of a water soluble salt of a carboxylic acid having the formula:

$$R_1(OC_nH_{2n})_mR_2COOH$$

wherein R_1 is an alkyl radical of C_6-C_{16}, n=2 to 4, m=0-20 and R_2=OCH_2 to OC_3H_6 or CH_2 to C_3H_6; 1% to 20% by weight of at least one humectant selected from the group consisting of propylene glycol, glycerine and sorbitol; 0.5% to 10% by weight of at least one hydrocarbon propellant selected from the group consisting of n-pentane, isopentane, neopentane, n-butane and isobutane; and 0.05% to 5% by weight of a preformed, water soluble, interpolymer gel reaction product formed by the rapid and intensive agitation of a cationic polymer bearing a positive charge selected from the group consisting of poly(diallyldimethylammonium chloride-co-acrylamide) and a quaternary ammonium cellulose ether polymer and an anionic polymer bearing a negative charge selected from the group consisting of poly(2-acrylamido-2-methylpropane sulfonic acid) and alginic acid, said interpolymer gel being effective to improve the foam characteristics, slip and after-feel properties of said composition.

4,528,112

POLYETHER POLYOLS FROM MIXED INITIATORS

George P. Speranza, and Michael Cuscurida, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,197

Int. Cl.³ C09K *3/00;* **H05B** *33/00*

U.S. Cl. 252—182 **12 Claims**

1. A polyether polyol for use in preparing high load bearing foams, the polyether polyol being produced by reacting

a. one or more alkylene oxides with

b. a mixture of alkoxylated initiators where the mixture was previously made, by mixing together

(1) 60 to 90 wt.% of a trifunctional alkoxylated initiator made by alkoxylating a triol selected from the group consisting of glycerine, trimethylolpropane and triethanolamine with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, 1,2-butylene oxide and mixtures thereof, and

(2) 10 to 40 wt.% of a secondary alkoxylated initiator having an active hydrogen functionality of from 4 to 8 made by alkoxylating a polyol selected from the group consisting of methyl glucoside, sorbitol and sucrose with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, 1,2-butylene oxide and mixtures thereof.

4,528,113

ANTHRAQUINONE DYE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE DYE

Shuji Imazeki; Akio Mukoh; Mikio Sato, all of Ibaraki; Masaharu Kaneko, Kanagawa; Tetsuo Ozawa, Tokyo, and Tomio Yoneyama, Kanagawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Hitachi Limited, both of Tokyo, Japan

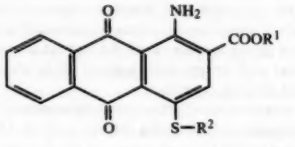
Filed Mar. 27, 1984, Ser. No. 593,788

Claims priority, application Japan, Mar. 29, 1983, 58-53175

Int. Cl.³ C09K *3/34;* **G02F** *1/13;* **C09B** *1/58, 1/60, 1/22*

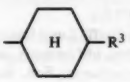
U.S. Cl. 252—299.1 **9 Claims**

1. An anthraquinone dye represented by the formula (I)

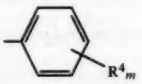


(I)

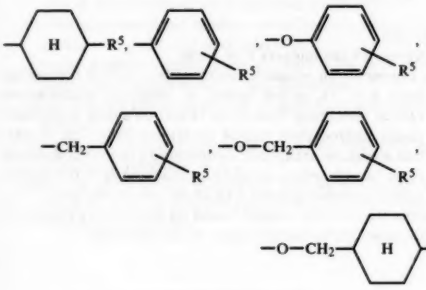
wherein R^1 is alkyl having 1 to 9 carbon atoms; alkoxy-alkyl;



wherein R^3 is hydrogen, alkyl having 1 to 9 carbon atoms, alkoxy having 1 to 9 carbon atoms or cycloalkyl which may be substituted; or



wherein R^4 is hydrogen, alkyl having 1 to 9 carbon atoms, alkoxy having 1 to 9 carbon atoms, alkoxyalkyl,



wherein R^5 is hydrogen, alkyl having 1 to 9 carbon atoms or alkoxyalkyl, halogen or dialkylamino, and m is an integer of 1 to 3, and R^2 is alkyl 1 to 18 carbon atoms, alkoxyalkyl, aryl which may be substituted, cyloalkyl, furfuryl, aralkyl or allyl.

4,528,114

ACETYLENES

Martin Petrzilka, Kaiseraugst, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

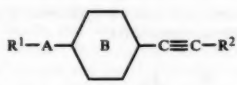
Filed Dec. 3, 1982, Ser. No. 446,835

Claims priority, application Switzerland, Dec. 18, 1981, 8111/81; Sep. 23, 1982, 5623/82

Int. Cl.[3] **C07C** *13/28, 15/50, 43/21, 69/75, 121/70, 5/00, 25/24, 67/08;* **C07D** *319/06, 239/26, 239/27, 239/28;* **G02F** *1/13;* **C09K** *3/34*

U.S. Cl. 252—299.6 **70 Claims**

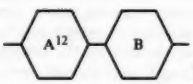
1. A compound of the formula



I

wherein A together with ring B comprise a central group of the formula:

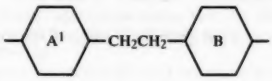
(a)



II

wherein ring A^{12} is trans-1,4-disubstituted cyclohexane, trans-2,5-disubstituted 1,3-dioxane linked in the 2-position with ring B, or when ring B is trans-1,4-disubstituted cyclohexane or R^2 is straight-chain alkyl of 1 to 7 carbon atoms, ring A^{12} also can be 1,4-phenylene or 2,5-disubstituted pyrimidine linked in the 2-position with ring B;

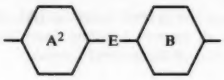
(b)



III

wherein ring A^1 is 1,4-phenylene, or trans-1,4-disubstituted cyclohexane; or

(c)



IV

wherein ring A^2 is 1,4-phenylene or trans-1,4-disubstituted cyclohexane and E is —COO— or —OOC—; ring B is 1,4-phenylene or trans-1,4-disubstituted cyclohexane; R^1 is straight-chain alkyl of 1 to 9 carbon atoms or when R^1 is attached to a benzene or a pyrimidine ring, R^1 also is straight-chain alkoxy of 1 to 9 carbon atoms; and R^2 is cyano or straight-chain alkyl of 1 to 7 carbon atoms.

4,528,115

LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY DEVICE

Yutaka Ishii, Nara; Shigehiro Minezaki, Ikoma; Shuichi Kozaki, Nara, and Fumiaki Funada, Yamato-Koriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1983, Ser. No. 490,713

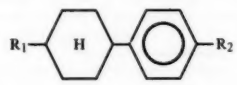
Claims priority, application Japan, Apr. 30, 1982, 57-74429

Int. Cl.[3] **G02F** *1/13;* **C09K** *3/34*

U.S. Cl. 252—299.63 **9 Claims**

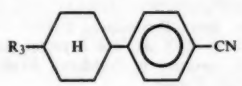
1. A liquid crystal composition comprising a mixed phase of at least one compound of the general formula:

(A)



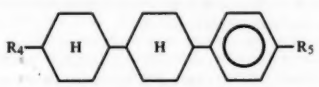
wherein R_1 is a saturated linear hydrocarbon group having 3 to 7 carbon atoms and R_2 is an ethoxy group, a propoxy group, or a butoxy group, at least one compound of the general formula:

(B)



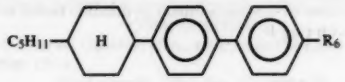
wherein R_3 is a saturated linear hydrocarbon group having 2 to 7 carbon atoms, at least one compound of the general formula:

(C)

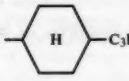


wherein R_4 is a saturated linear hydrocarbon group having 2 to 5 carbon atoms and R_5 is a saturated linear hydrocarbon group having 1 to 3 carbon atoms, at least one compound of the general formula:

(D)

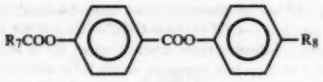


wherein R_6 is an ethyl group or a group of the formula



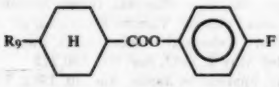
said compounds of the general formulas (A), (B), (C) and (D) being present in an amount totalling from 50–70 w/w%, at least one compound of the general formula:

(E)



wherein R_7 is a saturated linear hydrocarbon group having 4 to 6 carbon atoms and R_8 is a saturated linear hydrocarbon group having 3 to 7 carbon atoms and being present in an amount of from 15–25 w/w%, and at least one compound of the general formula:

(F)



wherein R_9 is a saturated linear hydrocarbon group having 4 to 8 carbon atoms and being present in an amount of from 15–25 w/w%.

4,528,116

LIQUID CRYSTALLINE CYCLOHEXYLBENZENE DERIVATIVES THEIR PREPARATION AND THE LIQUID COMPOSITIONS CONTAINING SAME

Roman Dabrowski; Jerzy Dziaduszek; Tomasz Szczuci ski; Zofia Stolarz; Jerzy Zieli ski, and Krystyna Kenig, all of Warsaw, Poland, assignors to Wojskowa Akademia Techniczna Im., Warsaw, Poland

Filed Mar. 29, 1984, Ser. No. 594,860

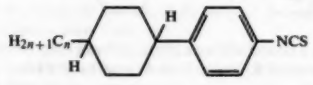
Claims priority, application Poland, Mar. 30, 1983, 241286; Mar. 30, 1983, 241288

Int. Cl.³ C09K *3/34*; G02F *1/13*; C07C *161/04*

U.S. Cl. 252—299.63 **5 Claims**

1. 4-/trans-4'-n-alkylcyclohexyl/-1-isothiocyanatobenzenes expressed by the general formula:

/I/



where n is an integer number from 1 to 12.

4,528,117

AQUEOUS ISOCYANATE EMULSIONS AND THEIR USE AS BINDERS IN A PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES

Hans-Joachim Scholl, Cologne; Helmut Reiff, Leverkusen, and Hanns I. Sachs, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,488

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921726

Int. Cl.³ B01J *13/00*; C07C *119/042*

U.S. Cl. 252—312 **9 Claims**

1. An emulsion comprising:

(A) from 80 to 20% by weight, based on the total emulsion, of water;

(B) from 18 to 79% by weight, based on the total emulsion, of an organic polyisocyanate;

(C) from 0.5 to 15% by weight, based on the total emulsion, of a sulfonic acid corresponding to the formula:

$$R_1—SO_3H)_n$$

wherein

n represents the integers 1 or 2 and

R_1 represents an aromatic, hydrocarbon radical containing from 6 to 14 carbon atoms, an aliphatic hydrocarbon radical containing from 10 to 18 carbon atoms, a cycloaliphatic hydrocarbon radical containing from 6 to 15 carbon atoms, an araliphatic hydrocarbon radical containing from 7 to 15 carbon atoms or an alkaromatic hydrocarbon radical containing from 7 to 24 carbon atoms; and

(D) from 0 to 10% by weight, based on the polyisocyanate, of a nonionic, surface-active agent as an emulsifier.

4,528,118

HIGHLY ELECTROCONDUCTIVE CONJUGATED POLYMER COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Ichiki Murase, Ootsu; Toshihiro Ohnishi, Takatsuki, and Takanobu Noguchi, Ootsu, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,534

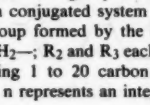
Claims priority, application Japan, Apr. 28, 1983, 58-74003; Jun. 30, 1983, 58-117123

Int. Cl.³ H01B *1/00*

U.S. Cl. 252—500 **20 Claims**

1. A highly electroconductive conjugated polymer composition which comprises a polymer having as the principal constitutive unit thereof a conjugated polymer structure $—R_1—CH{=}CH)_m$, wherein m is an integer satisfying the equation $2 \leqq m \leqq n$, obtained by subjecting to elimination in an inert atmosphere, sulfonium salt from a polyelectrolyte of sulfonium salt having the general formula (I)

(I)



wherein R_1 represents a group which forms a consecutive carbon to carbon conjugated system together with the adjacent vinylene group formed by the dehydrogenation of the group $>CH—CH_2—$; R_2 and R_3 each represents a hydrocarbon radical having 1 to 20 carbon atoms; X represents a counter ion; and n represents an integer larger than 2, and a dopant.

4,528,119

METAL BORIDES, CARBIDES, NITRIDES, SILICIDES, OXIDE MATERIALS AND THEIR METHOD OF PREPARATION

Albert L. Barnes, Wickliffe, Ohio, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Filed Jun. 28, 1984, Ser. No. 625,595
Int. Cl.[3] H01B *1/04, 1/08;* C01G *1/02, 23/04*
U.S. Cl. 252—503 30 Claims

1. The method of making a composition adapted for preparing refractory hard metal boride in a process first combining metal oxide with reducing agent, which method comprises:

establishing a solution of a non-oxide substance of said metal in liquid medium;

seeding said solution with solid and insoluble, ultrafine carbon particulates which maintain solid integrity in the resulting dispersion;

agitating the seeded dispersion;

gradually adjusting the pH of liquid medium, while agitation continues, by bringing said liquid medium in contact with organic, carbon-containing substance yielding hydroxyl ions in aqueous medium at elevated temperature;

establishing said liquid medium at sufficiently elevated temperature to yield said hydroxyl ions;

forming hydrous metal oxide crystals with said ultrafine particulate carbon seeds in said dispersion;

separating the resulting seeded crystals from said dispersion medium;

admixing the resulting separated seeded crystals with boron-containing substance; and

calcining the resulting admixture, thereby producing a calcined mixture for preparing hard metal boride by elevated temperature reaction.

4,528,120

REFRACTORY, ELECTRICALLY CONDUCTIVE, MIXED MATERIALS CONTAINING BORON NITRIDE AND PROCESS FOR THEIR MANUFACTURE

Klaus Hunold, Kempten; Alfred Lipp, Bad Worishofen, and Klaus Reinmuth, Durach, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 601,986
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325490
Int. Cl.[3] H01B *1/04*
U.S. Cl. 252—516 10 Claims

1. A refractory, electrically conductive, article comprising mixed materials, having a density of at least about 95% of the theoretical density and having non-direction-dependent properties, manufactured from powder mixtures that are substantially free of oxygen and metal impurities comprising:

from about 10 to 60% by weight of hexagonal boron nitride,

from about 0 to 60% by weight of at least one composition selected from aluminum nitride and silicon nitride, and

from about 30 to 70% by weight of at least one electrically conductive material selected from the group consisting of titanium boride, zirconium boride, aluminum boride, chromium boride, silicon carbide, titanium carbide and chromium carbide,

by isostatic hot pressing in a vacuum-tight casing, at a temperature of from about 1400° to 1700° C., under a pressure of from about 100 to 300 MPa, using an inert gas as a pressure-transfer medium.

4,528,121

ELECTROCONDUCTIVE CERAMICS

Yasuo Matsushita; Kousuke Nakamura, both of Hitachi, and Tetuo Kosugi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 546,094
Claims priority, application Japan, Oct. 27, 1982, 57-187598
Int. Cl.[3] H01B *1/04, 1/06*
U.S. Cl. 252—516 5 Claims

1. An electroconductive sintered ceramic which comprises 5 to 70 parts by weight of (a) alumina or an aluminous ceramic containing at least 95% by weight of Al_2O_3, and 30 to 95 parts by weight of (b) an inorganic compound which exhibits a positive resistance-temperature coefficient and which is selected from the group consisting of ZrB_2, ZrC, ZrN, $ZrSi_2$, TaB, TaC, TaN, $TaSi_2$, TiB_2, TiC, TiN, Mo_2B_5 and $MoSi_2$.

4,528,122

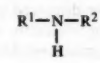
N-TYPE POLYACETYLENE AND A PROCESS FOR PRODUCING THE SAME

Makoto Murase, and Arimitsu Usuki, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Oct. 11, 1984, Ser. No. 659,842
Claims priority, application Japan, Oct. 11, 1983, 58-189638; Jan. 17, 1984, 59-6900; Mar. 5, 1984, 59-42273
Int. Cl.[3] C08K *5/16*
U.S. Cl. 252—518 17 Claims

1. An n-type polyacetylene, comprising:

polyacetylene doped with a mixture of a metal amide and a primary and/or secondary amine compound of the formula:



wherein R^1 and R^2 are each independently hydrogen, alkyl, aryl and allyl, or a substituent group which contains a carbonyl, silyl or amino group, with the proviso that if one of the R^1 and R^2 is a hydrogen atom, the other group is not a hydrogen atom.

4,528,123

PLASTIC-METAL LAMINATE, PROCESS, AND COMPOSITION

Wayne F. Nelson, Akron, Ohio, assignor to A. Schulman, Inc., Akron, Ohio

Division of Ser. No. 419,129, Sep. 17, 1982, Pat. No. 4,463,054. This application Apr. 9, 1984, Ser. No. 598,025
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—511 13 Claims

1. A plastic material having metal bonding properties suitable for preparing a metal strip having said plastic laminated on one side thereof free of galvanic disbonding comprising a metal bonding plastic material, in which said metal bonding plastic material comprises from about 60 to about 80 percent of a polymeric material and a balance of about 20 to about 40 percent of conductive carbon black, said polymeric material being selected from the group consisting of:

(a) an ionomeric copolymer containing between about 25 to about 98.5 percent ethylenic units and between about 1.5 to about 30 percent carboxylic acid units, at least the major proportion of which is in the free acid form, and

(b) a blend of said ionomeric copolymer and a compatible thermoplastic elastomer, said ionomeric copolymer being present in an amount effective to promote bonding between said metal and said metal bonding plastic material.

4,528,124

ALIPHATIC DICARBOXYLIC ACID ESTERS AS SCENTS

Wolfgang Sturm, Bevern; Gerd Mansfeld, Eschershausen, and Hans Reindl, Bevern, all of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

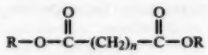
Filed Aug. 1, 1983, Ser. No. 518,869

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229300

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **12 Claims**

1. A scenting composition comprising a base and a scenting amount of at least one aliphatic dicarboxylic acid ester of the formula



in which

R is a methyl or isopropyl group, and

n is 9 or 10.

4,528,125

SUSTAINED RELEASE COMPOSITIONS

Daniel A. Alderman, and Maurice L. Zweigle, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1983, Ser. No. 471,595

Int. Cl.³ A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 A **15 Claims**

1. An aqueous dispersion capable of a sustained release of a fragrance, said dispersion comprising a plurality of particles of a water-insoluble, organophilic cellulose ether dispersed into an aqueous phase, said cellulose ether having reversibly diffused therein an organic fragrance which fragrance exhibits a greater affinity for the cellulose ether than for the aqueous phase.

4,528,126

2,4-DIOXA-7,10-METHANO-SPIRO [5,5] UNDECANES AND THEIR USE IN PERFUMERY COMPOSITIONS

Klaüs Bruns, and Thuy N. Dang, both of Krefeld-Traar, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

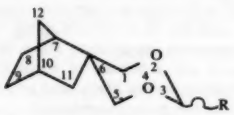
Continuation of Ser. No. 271,605, Jun. 8, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 538,938

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025187

Int. Cl.³ A61K *7/46*; C07D *319/06*

U.S. Cl. 252—522 R **4 Claims**

1. 2,4-dioxa-7,10-methano-spiro[5,5]undecanes having the formula



wherein R is a member selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, vinyl and propenyl and their isomeric mixtures.

2. A perfumery composition consisting essentially of from 1% to 50% by weight of the 2,4-dioxa-7,10-methano-spiro[5,5]undecane of claim 1 and the remainder customary constituents of perfumery compositions.

4,528,127

COMPOSITION FOR COATING A SUBSTRATE WITH AN EPOXY RESIN POWDER COATING AND A METHOD OF MAKING MATT FINISHES WITH THE COMPOSITION

Rolf Holderegger, Thalwil, and Josef H. Jilek, Wadenswil, both of Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 405,967, Aug. 6, 1982, abandoned. This application Aug. 10, 1984, Ser. No. 639,613

Int. Cl.³ C08G *59/42*

U.S. Cl. 525—530 **4 Claims**

1. A composition for coating a substrate with a powder coating composition comprising a solid polyepoxide resin, two different curing agents, a catalyst for promoting the reaction between the polyepoxide and the curing agents, and a pigment wherein at least 50 weight percent of the curing agent mixture is a 1:1 mole ratio adduct of rosin and maleic anhydride, said composition providing a matt finish on the surface of the article coated.

4,528,128

DETERGENT COMPOSITIONS

Appaya R. Naik, Merseyside, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,709

Claims priority, application United Kingdom, Jan. 21, 1983, 8301745

Int. Cl.³ C11D *1/12*

U.S. Cl. 252—549 **18 Claims**

1. A detergent-active, statistically distributed, dialkyl sulphosuccinate mixture derived from esterification of unesterified precursor with a mixture of straight-chain and/or 2-branched aliphatic alcohols, said alcohol radical chains comprising:

(a) 25 to 75 mole % of C_8 alcohol,

(b) 15 to 75 mole % of C_7 alcohol, and

(c) 0 to 35 mole % of C_6 alcohol,

said alcohol mix being substantially free of material of other chain lengths, said mixture being substantially free of dialkyl sulphosuccinates having alcohol radicals of other than C_6 to C_8 chain lengths.

4,528,129

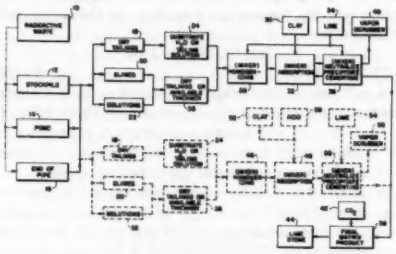
PROCESSING RADIOACTIVE WASTES AND URANIUM MILL TAILINGS FOR SAFE ECOLOGICALLY-ACCEPTABLE DISPOSAL

Frank Manchak, P.O. Box 30737, Santa Barbara, Calif. 93103

Filed May 3, 1982, Ser. No. 374,487

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—628 **4 Claims**



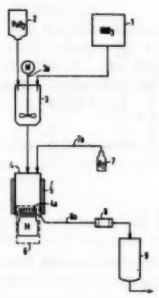
1. The method of treating acid leach uranium, radiological and toxic metal radon emitting waste selected from the class that consists of mill tailings, slimes and aqueous solutions to a dimensionally stable, substantially insoluble matrix that has a substantially lowered rate of randon emission, said method comprising the steps of:

a. transforming said waste into a homogeneous aqueous slurry;
b. agitating said slurry and sequentially adding a crystalline clay having an open lattice thereto, said clay including sodium and hydrogen ions to which a substantial number of molecules of water are bound, said lattice absorbing soluble salts of said metals in said waste;
c. adding said clay and continuing said agitation until said slurry is of pasty consistency;
d. directing said slurry of pasty consistency to a confined space;
e. mixing calcium oxide with said pasty slurry in said confined space in a sufficient quantity to:
1. raise the pH of said slurry above 8;
2. displace a substantial quantity of said sodium and hydrogen with calcium to liberate water from said clay;
3. transform the soluble salts of metals in said waste that are in said lattice of said clay into insoluble oxides and hydroxides that are locked therein as said hydrogen and sodium is replaced by calcium;
4. engender an exothermic reaction in said confined space that results in the slurry-calcium oxide mixture being transformed to said matrix with the concurrent emission of water in the form of steam from said slurry calcium oxide mixture into said confined space;
f. removing foreign material from said steam;
g. discharging said steam free of said foreign material from said confined space to the ambient atmosphere; and
h. removing said matrix from said confined space.

4,528,130
METHOD FOR DISSOLVING HARD-TO-DISSOLVE THORIUM AND/OR PLUTONIUM OXIDES

Friedrich-Wilhelm Ledebrink, Maintal; Wolfgang Rosenkranz, Waldsolms, and Wolfgang Stoll, Hanau, all of Fed. Rep. of Germany, assignors to ALKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 311,072
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038807
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—643 **13 Claims**



1. Method for dissolving hard-to-dissolve oxide selected from the group consisting of plutonium oxide and mixtures of plutonium oxide and thorium oxide and plutonium oxide and uranium oxide which comprises introducing said oxide together with fluoride-free nitric acid in a closed vessel, and in the absence of added hydrofluoric acid or fluoride heating the oxide and the nitric acid in the closed vessel to a temperature higher than the boiling temperature of nitric acid at normal pressure and maintaining the temperature higher than the boiling temperature of nitric acid at normal pressure for a time sufficient to dissolve the oxide.

4,528,131
PROCESS AND PREPARATION FOR THE QUANTITATIVE DETERMINATION OF SUBSTANCES ABLE TO BIND TO CEREBRAL RECEPTORS AND A PROCESS FOR PREPARING THE PREPARATION

Julianna Kardos; Gábor Maksay, and Miklós Simonyi, all of Budapest, Hungary, assignors to MTA Központi Kémiai Kutató Intézet, Budapest, Hungary

Filed Feb. 28, 1983, Ser. No. 470,043
Int. Cl.³ C07G *7/00*; G01N *33/58, 33/60*
U.S. Cl. 260—112 R **8 Claims**

1. A process for preparing a stable receptor preparation suitable for the quantitative determination of substances able to bind to cerebral receptors which comprises: homogenizing a brain or brain-region material with an aqueous solution of an inert substance soluble in water; centrifuging the formed homogenizate at an acceleration of 800 to 110 g for 8 to 20 minutes to form a supernatant; isolating the material from the supernatant by centrifuging the supernatant at an acceleration of 18,00 to 22,000 g for 10 to 20 minutes, the thus-obtained solid substance is rehomogenized in distilled water, the homogenizate is frozen and then thawed and thereafter centrifuged at an acceleration of 7000 to 9000 g for 5–15 minutes, the supernatant is isolated, centrifuged at an acceleration of 35,000 to 45,000 g for 20 to 30 minutes, the obtained solid substance is washed with an aqueous buffer solution of a pH value between 6 and 8, and a suspension consisting of the solid substance and the washing liquid is frozen and then thawed at least once and thereafter the suspension is lyophilized.

4,528,132
[16-ALANINE]CALCITONIN

Ronald C. Orlowski, Frankfort; Glenn L. Stahl, Bradley, and Robert L. Colescott, Bourbonnais, all of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,701
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 T **7 Claims**

1. A peptide having the structure:

Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Ala—His—Lys—Leu—Gln—
—Thr—Tyr—Pro—Arg—Thr—Asn—Thr—Gly—Ser—Gly—
—Thr—Pro—NH_2 (Salmon),

Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Ala—His—Lys—Leu—Gln—
—Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
—Thr—Pro—NH_2 (Eel), or

Cys—Gly—Asn—Leu—Ser—Thr—Cys—Met—Leu—Gly—
—Thr—Tyr—Thr—Gln—Asp—Ala—Asn—Lys—Phe—His—
—Thr—Phe—Pro—Gln—Thr—Ala—Ile—Gly—Val—Gly—
—Ala—Pro—NH_2 (Human).

4,528,133
BIOLOGICALLY ACTIVE TRIPEPTIDE AND TETRAPEPTIDE ALKYLAMIDES, AND METHOD FOR THE PREPARATION THEREOF

Evzen Kasafirek; Premysl Fric; Jan Slaby, and Alena Robalová, all of Prague, Czechoslovakia, assignors to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia

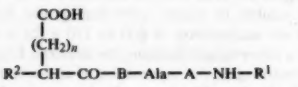
Filed Oct. 3, 1983, Ser. No. 538,095

Claims priority, application Czechoslovakia, Oct. 1, 1982, 7013-82

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **12 Claims**

1. Biologically active tripeptide and tetrapeptide alkylamide of the formula



wherein

(a) R^1 is selected from the group consisting of alkyl groups of 1 to 5 carbon atoms,

(b) A is a peptidically bound residue selected from the group consisting of alanine and proline,

(c) B is a peptidically bound residue selected from the group consisting of glycine, alanine and proline,

(d) n is an integer of 1 or 2, and

(e) R^2 is selected from the group consisting of alkylcarbonylamino groups of 2 to 12 carbon atoms, alkenyl groups of 6 to 12 carbon atoms, and benzyloxycarbonylamino groups.

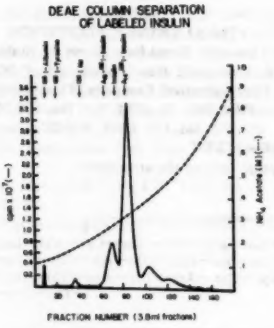
4,528,134
METHOD OF SEPARATING A_{14}-^{125}I-INSULIN FROM HETEROGENEOUSLY LABELED INSULIN MOLECULES FOR BIOLOGICAL STUDIES

Frankie B. Stentz; Reba K. Wright, and Abbas E. Kitabchi, all of Memphis, Tenn., assignors to University of TN Research Corporation, Knoxville, Tenn.

Filed Dec. 27, 1982, Ser. No. 453,279

Int. Cl.³ B01D *15/08*; A61K *37/26, 43/00*

U.S. Cl. 260—112.7 **7 Claims**



1. Method of preparing A_{14}-^{125}I-insulin comprising the steps of iodinating insulin with ^{125}I to produce an iodinated mixture containing heterogenous labelled insulin and unwanted materials, and separating the A_{14}-^{125}I-insulin in a separation having a first stage and a second stage, said first stage comprising absorbing said iodinated mixture in a packed bed of octadecylsilane bonded to silica, eluting said unwanted materials from said bed with a 0.1% solution of trifluoroacetic acid while retaining said labelled insulin, and eluting said labelled insulin from said bed with a solution of 1 or more parts by volume of acetonitrile to 1 part by volume of 0.1% trifluoroacetic acid to produce a labelled insulin concentrate, said second stage comprising separating the A_{14}-^{125}I-insulin from said concentrate.

4,528,135
PROCESS FOR THE PREPARATION OF PENICILLANIC ACID 1,1-DIOXIDES

Peter W. Henniger, Leiden; Johannes K. van der Drift, Delft; Jagdish C. Kapur, Delft, and Herman P. Fasel, Delft, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Apr. 19, 1983, Ser. No. 486,403

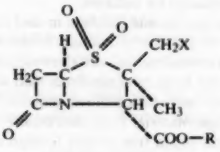
Claims priority, application United Kingdom, Apr. 19, 1982, 8211301

Int. Cl.³ C07D *499/00*

U.S. Cl. 260—245.2 R **10 Claims**

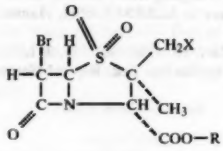
1. A process for the preparation of penicillanic acid 1,1-dioxides of the formula

II



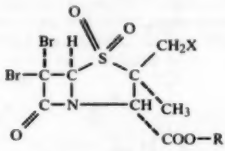
wherein X is selected from the group consisting of hydrogen, halogen and aceoxy and R is selected from the group consisting of hydrogen, a pharmaceutically acceptable metal ion and a pharmaceutically acceptable ester radical comprising debrominating 6-α-bromo- and/or 6,6-dibromo-penicillanic 1,1-dioxides selected from the group consisting of the formula

III



and

IV



wherein X and R have the above definition in an aqueous containing medium with zinc in association with an acid having a pK_a-value measured in water less than 3.5 and optionally if R is H converting the acid into a pharmaceutically acceptable salt or a pharmaceutically acceptable ester.

4,528,136
PROCESS FOR PREPARING 2-[BIS(ARYL)METHYL]BENZOIC ACIDS

Paul J. Schmidt, Sharonville, Ohio, and Patrick J. Jefferies, Fort Mitchell, Ky., assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

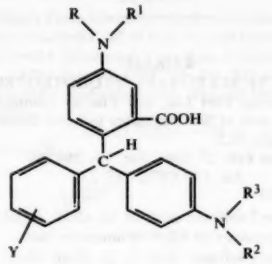
Division of Ser. No. 328,918, Dec. 9, 1981, Pat. No. 4,399,291. This application Apr. 14, 1983, Ser. No. 484,831

Int. Cl.³ C09B *11/10*

U.S. Cl. 260—391 **5 Claims**

1. A process for the production of 2-[(Y-phenyl)(4-N-R^2-N-

R[3]-aminophenyl)methyl]-5-N-R-N-R[1]-aminobenzoic acids of the formula



(II)

wherein:

R, R^1, R^2 and R^3 may be identical or different and each represents hydrogen, non-tertiary alkyl of one to four carbon atoms, hydroxyalkyl of two or three carbon atoms, phenyl or benzyl or phenyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms; and

Y represents hydrogen, halo, non-tertiary alkyl of one to four carbon atoms, non-tertiary alkoxy of one to four carbon atoms, or dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary alkyl of one to four carbon atoms and benzyl may be substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms

which comprises reacting in approximately equimolecular proportions a Y-benzaldehyde, an N-R^2-N-R^3-aniline and a 3-N-R-N-R[1]-aminobenzoic acid in which R, R^1, R^2, R^3 and Y have the meanings given for Formula II, in an acidic medium.

4,528,137

PROCESS FOR PREPARING FLUORINE-CONTAINING STEROIDS

Takao Takahara, Osaka, and Kazuhiro Shimokawa, Suita, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jan. 10, 1984, Ser. No. 569,733

Claims priority, application Japan, Jan. 12, 1983, 58-3064

Int. Cl.[3] C07J *1/00*

U.S. Cl. 260—397.4 **12 Claims**

1. A process for preparing a 6-fluorosteroid which comprises flourinating a 3-oxygenated-$\Delta^{3,5}$-steroid with a compound of the formula:

RCOOF

wherein R is a hydrocarbon group.

4,528,138

16-KETO-17-SUBSTITUTED THIA-17-ALKYL(OR ALKENYL OR ALKYNYL) ANDROSTENES

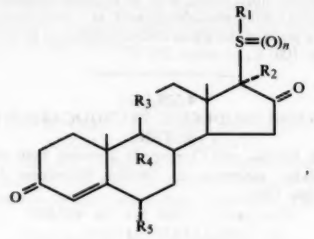
Ravi K. Varma, Belle Mead, and Donald S. Karanewsky, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 20, 1984, Ser. No. 622,509

Int. Cl.[3] C07J *1/00*

U.S. Cl. 260—397.45 **12 Claims**

1. A steroid having the formula

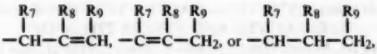


or a 1,2-dehydro derivative thereof, wherein

R_1 is alkyl, mono-, di- or trifluoroalkyl,

aryl or alkylthioalkyl, wherein R_6 is alkyl or aryl and m is 1, 2, 3 or 4;

R_2 is



wherein R_7, R_8 and R_9 are each independently hydrogen or alkyl of 1 to 4 carbon atoms;

R_3 is carbonyl or β-hydroxymethylene;

R_4 is hydrogen or halogen;

R_5 is hydrogen, methyl or fluorine; and

n is 0, 1 or 2;

with the proviso that if R_1 is alkylthioalkyl, n is 0.

4,528,139

PROCESS FOR OBTAINING ETHANOLIC PHOSPHATIDE FRACTIONS HIGHLY ENRICHED WITH PHOSPHATIDYLCHOLINE

Wolfgang Napp, Cologne, Fed. Rep. of Germany, assignor to A. Nattermann GmbH & Coe KG, Cologne, Fed. Rep. of Germany

Filed Jul. 15, 1983, Ser. No. 514,003

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227001

Int. Cl.[3] A23J *7/00*; C07F *9/02, 9/10*; C11C *3/00*

U.S. Cl. 260—403 **8 Claims**

1. Process for the preparation of phosphatide fractions highly enriched with phosphatidylcholine by treatment of a solution of an ethanol extract obtained from commercially available de-oiled crude vegetable phosphatides with aluminum oxide, comprising warming up the ethanol solution to an elevated temperature before the addition of the aluminum oxide, mixing this warmed up ethanol solution with 2.5 to 3.5 times the amount, based on the solids content, of aluminum oxide, stirring the mixed ethanol solution and aluminum oxide at temperatures between 50° C. and 70° C. until the equilibrium saturation concentration is established, separating the laden aluminum oxide, and evaporating to dryness the resulting clear solution to provide the phosphatide fractions.

4,528,140

SYNTHESIS OF ALPHA-DITHIOPHOSPHATO AMIDES

Robert J. Crawford, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 8, 1983, Ser. No. 512,299

Int. Cl.[3] C08H *3/00*

U.S. Cl. 260—402.5 **11 Claims**

1. A process of synthesizing alpha-substituted, O,O-dialkyl

dithiophosphato amides comprising the step of contacting a C_8–C_{22} alpha-chloro amide with an aqueous solution of a salt of O,O-dialkyl dithiophosphoric acid, at a temperature above the melting point of the alpha-chloro amide and in the range of from about 100° C. to about 200° C.

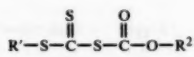
4,528,141

PROCESS FOR PRODUCING TRITHIOCARBONIC ACID ESTERS

Kenneth B. Kimble, and Clarence R. Bresson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1983, Ser. No. 458,505
Int. Cl.³ C07C *154/00*
U.S. Cl. 260—455 B **15 Claims**

1. The composition represented by the formula



wherein R′ is selected from the group consisting of lower alkyl and lower alkenyl radicals, and wherein R^2 is selected from the group consisting of lower alkyl and lower alkenyl radicals.

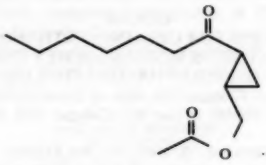
4,528,142

1-HYDROXYMETHYL-2-ACYL CYCLOPROPANE DERIVATIVES AND ESTERS THEREOF

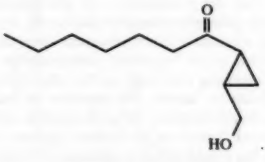
Richard M. Boden, Ocean; Marie R. Hanna, Hazlet, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 422,486, Sep. 23, 1982, Pat. No. 4,435,428.
This application Oct. 12, 1983, Ser. No. 541,031
Int. Cl.³ C07C *69/96, 69/14, 49/172*
U.S. Cl. 260—463 **3 Claims**

1. The 1-hydroxymethyl-2-acyl cyclopropane derivative having the structure:



3. The 1-hydroxymethyl-2-acyl cyclopropane derivative having the structure:



4,528,143

PROCESS FOR THE PREPARATION OF 4-CHLORO-2-NITROBENZONITRILE

Masayasu Kurono, Nagoya; Takuji Yamaguchi, Kuwana, and Toshinao Usui, Gifu, all of Japan, assignors to Sanwa Kagaku Kankyusho Co. Ltd., Nagoya, Japan

Filed Oct. 31, 1983, Ser. No. 546,866
Claims priority, application Japan, Nov. 26, 1982, 57-206020
Int. Cl.³ C07C *121/52*
U.S. Cl. 260—465 G **6 Claims**

1. A process for the preparation of 4-chloro-2-nitrobenzonitrile comprising reacting 2,5-dichloronitrobenzene with copper (I) cyanide in an inert solvent in the presence of an inorganic cyanide at a temperature of 140° to 170° C. for 2.6 to 6.0 hours.

4,528,144

TERPENE SULFONATE HYDROTROPES

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,184
Int. Cl.³ C07C *143/22*
U.S. Cl. 260—503 **4 Claims**

1. p-Menthane-7-sulfonic acid or its alkali metal, alkaline earth metal, ammonium or alkylolammonium salt.

2. p-Menthane-2-sulfonic acid or its alkali metal, alkaline earth metal, ammonium or alkylolammonium salt.

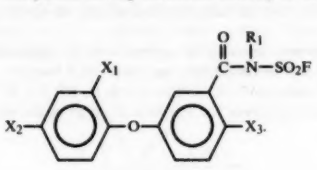
4,528,145

HERBICIDAL N-SUBSTITUTED-5(SUBSTITUTED-PHENOXY)-2-SUBSTITUTED BENZOIC ACID SULFAMIDOYL FLUORIDE

El-Ahmadi I. Heiba, 11 Balsam La, Princeton, N.J. 08540

Filed Sep. 24, 1982, Ser. No. 422,585
Int. Cl.³ C07C *149/43*
U.S. Cl. 260—543 F **5 Claims**

1. A compound having herbicidal activity of the formula



I

wherein

R_1 is a moiety conferring biochemical lability on the resulting fluoride and is selected from H and salts thereof; chlorine; and sulfenyl moiety (SR_2) in which R_2 is methyl, polyhalomethyl, COO—alkyl (C_1–C_4), or C_1–C_4-dialkylamino;

X_1, X_2, X_3 are herbicidal properties imparting substituents selected from halogen, polyhalomethyl, NO_2, CN, (C_1–C_4)alkyl and (C_1–C_4) alkoxy.

4,528,146

PROCESS FOR THE PREPARATION OF TEREPHTHALOYL AND ISOPHTHALOYL DICHLORIDES

Walter Böckmann; Friedrich Brühne, and Karl-August Lipper, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

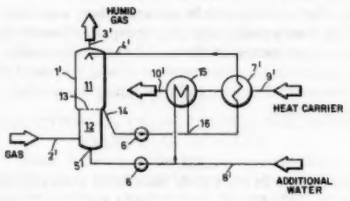
Filed May 12, 1983, Ser. No. 493,905
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220729
Int. Cl.³ C07C *51/60*
U.S. Cl. 260—544 D **12 Claims**

1. In a process for the preparation of terephthaloyl and/or isophthaloyl dichloride by chlorination of dimethyl terephthalate and/or dimethyl isophthalate with chlorine gas at a temperature from 100° to 250° C., the improvement wherein the process is carried out in the presence of 20 to 200% by weight, relative to the combined amount of dimethyl terephthalate and dimethyl isophthalate, of terephthaloyl and/or isophthaloyl dichloride.

4,528,147
PROCESS FOR HUMIDIFYING A GAS STREAM, PARTICULARLY IN METHANOL AND/OR AMMONIA PLANTS

Hartmut Ilgner; Peter Kledewski, both of Dortmund, and Reinhard Heun, Herdecke, all of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,636
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236441
Int. Cl.³ B01F 3/04
U.S. Cl. 261—128 15 Claims

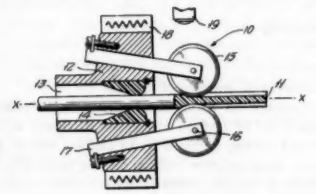


1. A process for humidifying a gas stream comprising passing heated liquid water through a gas humidifier chamber countercurrently to the flow of the gas stream to transfer water vapor to the gas stream, removing one or more portions of the liquid water at an intermediate stage during the water's passage through the chamber, removing the remaining portion of liquid water from the chamber, adding make-up water to the removed water corresponding to the amount of water vapor transferred, heating all the water portions and recycling them to the humidifier chamber.

4,528,148
METHOD AND APPARATUS FOR FORMING GROOVES IN AN OPTICAL FIBER SUPPORT

Enrico Dotti, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Jun. 21, 1982, Ser. No. 390,653
Claims priority, application Italy, Jun. 26, 1981, 22578 A/81
Int. Cl.³ G02B 5/14
U.S. Cl. 264—1.5 16 Claims



1. Method for manufacturing an elongated, optical fiber cable, core element with a longitudinally extending, surface groove or longitudinally extending surface grooves of a predetermined depth for receiving an optical fiber or fibers, said method comprising:

continuously advancing by pulling, along a line of advance, an elongated filament comprising a reinforcing core with an outer layer of thermoplastic material of a thickness sufficient to provide said groove or grooves of said predetermined depth, said outer layer being without said groove or grooves at the outer surface thereof and said reinforcing core having a greater resistance to tension and compression forces than said thermoplastic material; and

as said filament is advanced, pressing the heated surface of a rotatable upsetting means into said outer layer of thermoplastic material at the circumferential portions of the filament where the groove or grooves are to be formed to displace softened thermoplastic material without removing it from the filament, said surface being movable by the thermoplastic material substantially in the direction of advance of said filament.

4,528,149
HOLLOW SPHERICAL BODIES OF SOLIDIFIED ALKALI METAL SILICATE

Winfried Wichelhaus, Mettmann, and Christine Schröder, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 30, 1983, Ser. No. 567,400
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314259
Int. Cl.³ C03C 19/10
U.S. Cl. 264—13 17 Claims

1. A process for the production of hollow, spherical bodies of solidified alkali metal silicates having the general formula

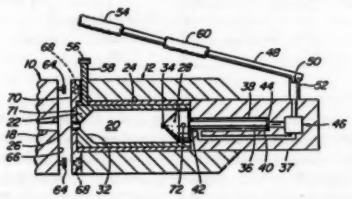
$$M_2O{:}x.SiO_2$$

where M is an alkali metal and x has a value greater than 3.6 and less than 12, said hollow bodies having an external diameter of from 1 to 5 mm, shell thickness of from 0.2 to 0.6 mm, a water content of from 10% to 30% by weight and a solids content of at least 70% by weight, the M_2O content of the shell of said hollow bodies being greater internally and less toward the exterior surface consisting essentially of the steps of (1) introducing an alkali metal silicate solution dropwise into a solution of a water-soluble hardener for an alkali metal silicate solution where the ratio between the density of the alkali metal silicate solution and the density of the hardener solution is between 1.02 and 1.2, and the pH of said hardener solution is maintained between 4 and 10, (2) heat treating the solid product obtained in a solution of a hardener for an alkali metal silicate solution at a temperature in the range of from 103° C. to 120° C., and (3) separating and recovering said hollow spherical bodies of solidified alkali metal silicates.

4,528,150
METHODS AND APPARATUS FOR SEALING ARTICLES

Leonard J. Charlebois; Renato Mariani, and Fred A. Huszarik, all of Kanata, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 421,857, Sep. 23, 1982, abandoned. This application Aug. 30, 1983, Ser. No. 527,759
Int. Cl.³ B29F 1/00
U.S. Cl. 264—36 4 Claims



1. A method of sealing an article comprising:

heating plastic material in a chamber to melt the plastic and render it flowable and homogeneous;

forcing the molten flowable material from an outlet of the chamber and through an inlet of a reservoir defined within a manually portable accumulator;

maintaining the plastic material homogeneous and at a molten flowable temperature while held in the reservoir;

disposing the reservoir in communication with a mould cavity partly defined by the article to be sealed; and

forcing the molten flowable material from the reservoir into the mould cavity at a sufficiently fast rate to fill the cavity before flow passages into the cavity become blocked with hardening material.

4,528,151

PROCESS FOR PRODUCING A BLOW MOLDING RESIN

Yoshiho Matsuo; Ryoji Nishijima; Atsuhiko Yoshino, and Takai Kawashima, all of Ichihara, Japan, assignors to Nissan Chemical Industries, Ltd. and Nissan Maruzen Polyethylene Company, both of Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,877

Claims priority, application Japan, Mar. 12, 1983, 58-40027

Int. Cl.³ B29C *17/14;* **B29F** *3/00*

U.S. Cl. 264—83 **6 Claims**

1. A process for producing a blow molding resin which comprises pelletizing a high density polyethylene prepared by means of a highly active Ziegler catalyst, at a temperature of at least 230° C. in the presence of an oxygen containing gas so as not to change the average molecular weight and the molecular weight distribution, wherein the oxygen concentration during the pelletizing is within a range of from 0.5 to 21% by volume.

4,528,152

METHOD FOR OBTAINING DRAIN-CAST HOLLOW ARTICLES FOR CERAMIC WARE

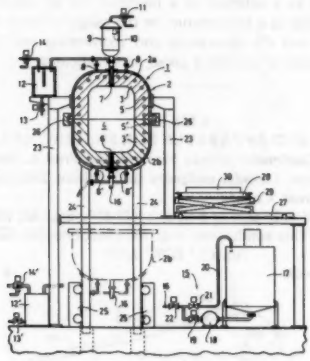
Fumihiko Aoyama; Kazushige Murata, both of Tokoname, and Masahiro Hayashi, Nagoya, all of Japan, assignors to Inax Corporation, Tokoname, Japan

Filed May 12, 1983, Ser. No. 494,099

Claims priority, application Japan, May 27, 1982, 57-91086

Int. Cl.³ B28B *1/26*

U.S. Cl. 264—87 **17 Claims**



1. A method for drain-casting a slip to obtain a substantially hollow molded article, by the use of an apparatus comprising a mold including at least two divisible mating mold portions to form a mold cavity, each mold portion including a pressure-proof air-tight vessel and a filter member inside the vessel, said filter member containing a water-drainage means, said water-drainage means being communicated with the openings outside of the vessel, one of said mold portions having an overflow duct communicated with the outside of the vessel, and one other mold portion having a slip supply duct; which method comprises the steps of:

supplying slip through the slip supply duct to the mold cavity until the supplied slip overflows the overflow duct;

closing the slip supply duct and pressurizing the slip within said mold cavity via the overflow duct to facilitate deposition of the slip onto the filter members of the mold to a desired thickness, water being drained from the mold via said water drainage means;

adjusting the position of the slip supply duct downward and draining the undeposited slip remaining in the mold cavity through the slip supply duct;

depressurizing the water-drainage means of one mold portion to create a vacuum between said one mold portion and the resulting article thereby attracting the resulting article into said one mold portion, applying compressed air to the water-drainage means of the other mold portion to exude some water between the filter member and the resulting molded article, and removing said other mold portion from the molded article; and then

hanging the molded article attracted into said one mold portion over a stand, applying compressed air to the water-drainage means of the mold portion to exude some water between the filter member of said one mold portion and the molded article, and demolding the molded article onto the stand.

4,528,153

PROCESS FOR PRODUCING MOLDED PARTICULATE ARTICLES UTILIZING A SELF-RELEASING BINDER BASED ON A SULFONIC ACID MODIFIED ISOCYANATE

Hans-Joachim Scholl; Hanns I. Sachs, both of Cologne; Gert Jabs, Odenthal, and Günther Loew, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 150,495, May 16, 1980, Pat. No. 4,478,738. This application Sep. 20, 1982, Ser. No. 422,407

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921689

Int. Cl.³ B29J *5/02*

U.S. Cl. 264—109 **12 Claims**

1. A process for producing molded articles comprising:

(A) introducing into a mold particulate organic and/or inorganic material from which pressed articles may be produced, the material being mixed and/or impregnated with a substantially anhydrous binder;

(B) hot pressing the material; and

(C) removing the material from the mold; wherein the binder comprises:

(a) a polyisocyanate; and

(b) a sulfonic acid corresponding to the general formula:

$$R\text{-}(SO_3H)_n$$

wherein

n represents an integer of 1 or 2;

R represents an aromatic hydrocarbon radical having from 6 to 14 carbon atoms, an aliphatic hydrocarbon radical having from 10 to 18 carbon atoms, a cycloaliphatic hydrocarbon radical having from 6 to 15 carbon atoms or an alkaromatic hydrocabon radical having from 7 to 24 carbon atoms; and

the equivalent ratio of the components (a) and (b) is 100:0.5 to 100:20.

4,528,154

PREPARATION OF MOLDED LIGNOCELLULOSIC COMPOSITIONS USING AN EMULSIFIABLE POLYISOCYANATE BINDER AND AN EMULSIFIABLE CARBOXY FUNCTIONAL SILOXANE INTERNAL RELEASE AGENT

Tinh Nguyen, Germantown, Md., and James M. Gaul, Exton, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 15, 1983, Ser. No. 504,698

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—109 **9 Claims**

1. In a process for the preparation of lignocellulosic compos-

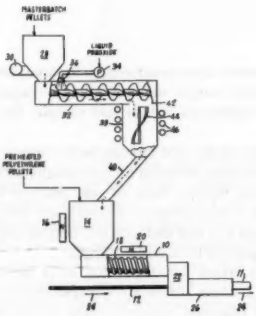
ite molded articles wherein lignocellulosic particles are contacted with a polyisocyanate composition and the treated particles are subsequently formed into molded articles by the application of heat and pressure, the improvement which comprises imparting self-releasing properties to said lignocellulosic molded articles by contacting said lignocellulosic particles with from about 1.5 to 12 weight percent, based on oven dried lignocellulosic particles of a preblended mixture of an aqueous emulsified organic polyisocyanate, having a concentration of polyisocyanate of from about 10 to 75 percent by weight in water, with an aqueous emulsified carboxy functional siloxane having a concentration of carboxy functional siloxane of from about 0.1 to 90 percent by weight in water said preblended mixture having a concentration of emulsifiable carboxy functional siloxane of between about 0.4 and 6.0 percent by weight based on the emulsifiable polyisocyanate employed.

4,528,155

PRODUCTION OF CROSS-LINKED POLYMERIC EXTRUDED ARTICLES

Danny S. Elder, Montoursville, Pa., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Jul. 12, 1983, Ser. No. 512,958
Int. Cl.³ B29F *3/10*
U.S. Cl. 264—174 **17 Claims**



1. In a method of producing a cross-linked extruded article of ethylene-containing polymer, wherein pellets of ethylene-containing polymer and a minor proportion of a peroxide cross-linking agent are charged to an extruder having a feed screw for heating, working and extrusion to form the article, followed by heating of the article to effect cross-linking thereof, the steps of

(a) providing a first proportion of ethylene-containing polymer pellets, preheated to a temperature above the melting point of the peroxide, at a first locality;

(b) advancing said first proportion of pellets from the first locality to a second locality while applying the peroxide in liquid state to the surfaces of the preheated pellets and agitating the last-mentioned pellets with the applied peroxide so as to disperse the peroxide for absorption in the pellets;

(c) commingling said first proportion of pellets with a second proportion of preheated ethylene-containing polymer pellets at the second locality; and

(d) after absorption of the peroxide in said first proportion of pellets is complete, delivering the commingled first and second proportions of pellets to the extruder for immediate admixture therein, while

(e) continuously maintaining said first proportion of pellets at an elevated temperature throughout their advance from the first locality to the extruder, such that the temperature of the pellets is above the melting point of the peroxide until the peroxide is absorbed in the pellets and thereafter is at a value at which the amount of peroxide soluble in said first proportion of pellets is greater than the amount of peroxide absorbed in said first proportion of pellets.

4,528,156

METHOD FOR THE PREPARATION OF A SHAPED ARTICLE OF CURED SILICONE RUBBER

Takeshi Fukuda, and Satoshi Yumoto, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,367
Claims priority, application Japan, Sep. 30, 1982, 57-171188
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—236 **12 Claims**

1. A method for the preparation of a cured silicone rubber article which comprises the steps of:

(a) admixing an organopolysiloxane having at least two aliphatically unsaturated hydrocarbon groups per molecule and having a sufficiently high degree of polymerization with a catalytic amount of a platinum catalyst to form an organopolysiloxane composition which is by itself not curable,

(b) shaping the organopolysiloxane composition into the form of a desired article, and

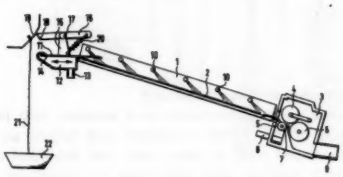
(c) bringing the shaped form of the organopolysiloxane composition into contact with a liquid organohydrogenpolysiloxane to effect diffusion thereof into the shaped form.

4,528,157

FEEDING OF MOLTEN STRANDS TO A DISCHARGE TROUGH

Horst H. Lettner, Glattbach; Friedrich Hunke, Grossostheim, and Hans Hench, Inzlingen, all of Fed. Rep. of Germany, assignors to Automatik Apprate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,714
Int. Cl.³ B29F *3/08*
U.S. Cl. 264—237 **19 Claims**



1. Apparatus including a slanting cooling discharge trough with an upper end that can be extended beneath the fall line of at least one strand of molten material emerging from a nozzle and can be retracted to permit the free passage of the strand away from the discharge trough, comprising

a segment equipped with a separational element and movable independently said trough; and

means for linearly moving said segment with respect to said trough from a non-operating position out of contact with said strand into an operating position where the strand emerging from said nozzle is captured by said segment to guide the strand into the cooling section of said discharge trough.

14. The method of feeding at least one strand of molten material to a cooling discharge trough which comprises the steps of

(a) providing a segment portion which is movable independently of said trough

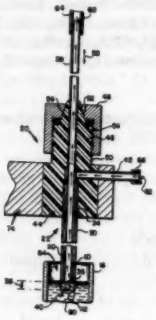
(b) extending said segment portion into the path of said strand emerging from a nozzle to capture the strand and guide it into said cooling portion of said trough.

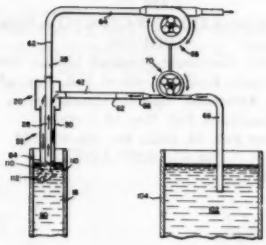
4,528,158

AUTOMATIC SAMPLING SYSTEM

Pieter Gilles, Rijswyk, Netherlands, and Jean-Claude Schmitt, Draveil, France, assignors to Baird Corporation, Bedford, Mass.

Filed Jun. 14, 1982, Ser. No. 388,485
Int. Cl.[3] G01N *1/14, 35/00*
U.S. Cl. 422—63 6 Claims





1. A sampling system comprising:

(a) a tube assembly mounted in a member, said member formed of two parts: a resilient part having an upper dome-shaped end, a lower end and provided with a stepped, internal bore extending concentrically therethrough, said resilient part also having an externally-threaded upper portion near said dome-shaped portion, and a rigid part having an internally-threaded cylindrical portion and a central beveled portion designed to fit over and to mesh with said externally-threaded portion and said dome-shaped portion of said resilient part;

(b) said tube assembly including an inner tube extending through and beyond said ends of said resilient part and terminating in a first end and a second end, and an outer tube concentrically spaced about said inner tube and having first and second ends, said tubes being received within said stepped bore of said resilient part, said first ends of said inner and said outer tubes being offset from one another, and said second end of said outer tube terminating in said stepped bore;

(c) said rigid part designed to compress said resilient part, particularly its said dome-shaped portion about said inner tube so as to adjust and to fix the extent of said offset of said inner tube and said outer tube first ends; and

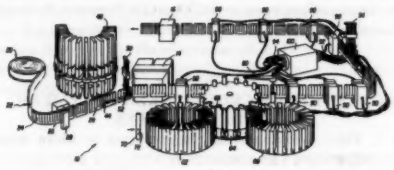
(d) a further tube mounted in said member at an angle to and communicating with the space defined between said inner and said outer tube and having a free end.

4,528,159

AUTOMATED ANALYSIS INSTRUMENT SYSTEM

Max D. Liston, Irvine, Calif., assignor to American Hospital Supply Corp., Evanston, Ill.

Continuation-in-part of Ser. No. 284,842, Jul. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 284,841, Jul. 20, 1981, Pat. No. 4,477,190, which is a continuation-in-part of Ser. No. 284,840, Jul. 20, 1981, abandoned. This application Jul. 20, 1982, Ser. No. 400,191
Int. Cl.[3] G01N *35/04*
U.S. Cl. 422—65 40 Claims



1. An automated instrument system for analyzing the constituents of a patient sample while reacting a reagent specific for the selected constituent within said sample, the system comprising:

(a) a continuous flexible cuvette belt comprising a series of parallel, discrete reaction compartments formed in spaced relationship therein, each of said discrete reaction compartments being substantially optically transparent, having an open top end and a closed bottom end and adapted for engagement by a cuvette track;

(b) carousel means for dispensing solid tabletted reagents into said discrete reaction compartments of such cuvette belt, said tabletted reagents being stored in a series of tablet dispensers within the carousel;

(c) means for effecting ultrasonic dissolution of said tabletted reagents, said means being positioned along a cuvette track between the carousel means for dispensing solid tabletted reagents and the means for dispensing sample;

(d) means for dispensing sample from a patient sample container into said discrete reaction compartments of said cuvette;

(e) means for transport of the patient sample container including a carousel assembly located downstream from said reagent dispenser, said carousel assembly comprising:

(i) a loading carousel into which patient sample containers can be randomly loaded,

(ii) a transfer carousel which accepts patient sample containers from the loading carousel and positions them in cooperative relation with the sample dispensing means, said transfer carousel including means for identifying said patient sample container from coded information contained on said sample container, and

(iii) an unloading carousel which receives patient sample containers from the transfer carousel subsequent to transfer of a portion of the sample to a discrete reaction compartment of the cuvette belt;

(f) a plurality of analysis stations arranged in linear relationship to one another along a track for advancement of the cuvette belt; and

(g) means for transporting, at a pre-determined rate, said cuvette belt along a continuous cuvette tract past a plurality of analysis stations.

4,528,160
GAS DOSIMETER CONSTRUCTION

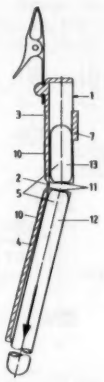
Wolfgang Eckstein, Sereetz; Kurt Leichnitz, Gross Gronau; Karl-Heinz Pannwitz, Lübeck; Horst Rabenecker, Stockelsdorf, and Günter Wolff, Schwartau, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 615,928

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321356

Int. Cl.³ G01N *1/22*

U.S. Cl. 422—86 **7 Claims**



1. A gas dosimeter, comprising an outer housing of first and second parts joined together by a hinge, a transparent indicator tube in said housing being initially closed at each end and having a breakpoint intermediate its length positioned adjacent said hinge with a reaction section of said indicator tube being in said second part of said housing on one side of said breakpoint and the remaining breakoff part being in said housing first part, said housing first and second parts being pivotable about said hinge to break said indicator tube along said break point to open said reaction section, said reaction section being retainable in said housing after being opened to permit the ambient atmosphere to diffuse into said reaction section.

4,528,161
PROBE FOR AUTOMATED LIQUID DISPENSER

John F. Eckert, San Rafael, Calif., assignor to American Hospital Supply Corp., Evanston, Ill.

Filed Aug. 31, 1981, Ser. No. 297,960

Int. Cl.³ B01L *3/02*

U.S. Cl. 422—100 **10 Claims**

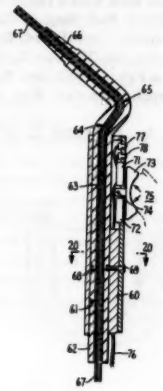
1. A hand-held probe for manipulating and holding flexible pipette tubing trained completely through it in an automated liquid dispenser comprising

a handle having two ends and a linearly, axially extending interal bore therebetween;

a tube holder partially sleeved within the handle bore and itself having a central bore for receiving a flexible pipette tubing trained completely through it,

said tube holder comprising a linearly extending portion between the ends of said handle and a goose-neck shaped portion located external of said handle,

said goose-neck shaped portion having first and second serially disposed reverse curve sections adjacent the handle to embrace and to restrain movement of a flexible



pipette tubing only by frictional engagement of it against the walls of the central bore at the reverse curve sections.

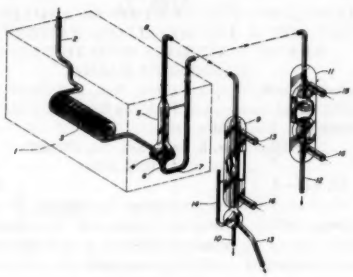
4,528,162
DISTILLATION APPARATUS

Anton E. Goodwin; Janet L. Marton; Robert M. Owens; Jackie W. Whisenhunt, and Roy D. Swain, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 18, 1982, Ser. No. 409,191

Int. Cl.³ B01D *3/06*; G01N *1/00*

U.S. Cl. 422—101 **4 Claims**



1. A continuous simple distillation apparatus for removal of volatiles from liquid phase comprising

(a) casing means containing therein a closed conduit for liquid distilland, said conduit surrounded by heating means contained within said casing means;

(b) a vapor draw means connected directly to said closed distilland conduit, said vapor draw means containing at least one expansion chamber vertically disposed in and surrounded by said heating means, the lower portion of the lowest of said expansion chambers containing inert particulate means to increase surface area, and condenser means connected to said vapor draw means;

(c) a bottoms draw means disposed in said heating means and connected to the lower portion of the lowest expansion chamber of said vapor draw means, said bottoms draw means exiting substantially vertically from said lowest chamber and being substantially totally filled with said inert particulate means.

4,528,163

CRUCIBLE FOR SEMICONDUCTOR MANUFACTURING PURPOSES AND A PROCESS FOR MANUFACTURING THE CRUCIBLE

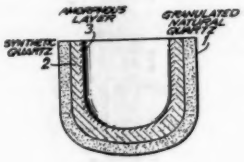
Horst Albrecht, Hanau, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 156,726, Jun. 5, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,515

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928089

Int. Cl.³ C30B *15/10*

U.S. Cl. 422—249 **8 Claims**



1. A crucible for semiconductor technological purposes, especially for the production of silicon crystals comprising a silicon dioxide containing outer layer, an inner layer homogeneously bonded to the outer layer at their interface and comprising synthetic crystalline quartz, said inner layer in turn having on its surface opposed from the silicon dioxide-containing outer layer, an exposed smooth surface consisting essentially entirely of amorphous fused silica.

4,528,164

CONCURRENT PRODUCTION OF ANHYDROUS NON-METAL AND METALLOID HALIDES AND CERAMIC MATERIALS WITH THE AID OF MAGNESIUM HALIDE

Emanuel Cooper, West Lafayette, Ind., and David H. Kohn, Haifa, Israel, assignors to Technion Research & Development Foundation, Inc., Haifa, Israel

Filed Mar. 8, 1984, Ser. No. 585,635

Int. Cl.³ C01G *3/05*

U.S. Cl. 423—1 **35 Claims**

1. A process for the concurrent production of a volatile anhydrous halide of titanium, aluminum, zirconium, boron, trivalent iron or a combination thereof, as well as a crystalline ceramic compound, consisting essentially of:

mixing a technical grade halide of magnesium, calcium or divalent iron with a second oxide selected from the group consisting of oxides of silicon, aluminum, boron, phosphorus, chromium and titanium or a natural mineral containing one or more of said oxides;

heating the mixture to a temperature in the range of 550°–1100° C.;

admixing a first oxide selected from the group consisting of oxides of titanium, aluminum, zirconium, boron and trivalent iron, or compounds of natural minerals containing one or more of said oxides, said first oxide being the same as or different from said second oxide;

subjecting the mixture so obtained to a temperature in the range of 550°–1100° C., in an atmosphere which is dry and substantially inert, while continuously withdrawing evolved gaseous components;

recovering the volatile halide of titanium, aluminum, zirconium, boron trivalent iron or combination thereof present in said withdrawn gaseous components; and

recovering the crystalline ceramic compound which results from said reacting step.

4,528,165

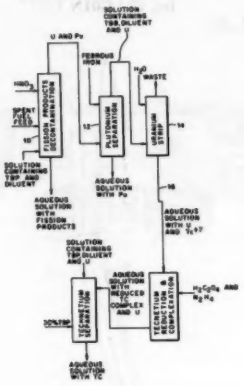
SEPARATION OF URANIUM FROM TECHNETIUM IN RECOVERY OF SPENT NUCLEAR FUEL

Horace A. Friedman, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 13, 1984, Ser. No. 559,501

Int. Cl.³ C01G *43/00, 57/00*

U.S. Cl. 423—10 **2 Claims**



1. In a spent nuclear fuel recovery process wherein a stream containing U and Tc^{+7} is contacted with an organic phase containing tributyl phosphate and an organic diluent to extract U and Tc^{+7} from said stream into said organic phase and subsequently U and Tc^{+7} are stripped from said organic phase into an aqueous solution, the improvement comprising:

(1) contacting said aqueous solution with hydrazine and oxalic acid to thereby convert the Tc^{+7} therein to a reduced Tc species and form a soluble oxalate complex of said reduced Tc species; and

(2) contacting said aqueous solution containing U and the complex of the reduced Tc species with an organic phase containing tributyl phosphate and an organic diluent to extract U from said aqueous solution into said organic phase while leaving substantially all of the reduced Tc species in the aqueous solution.

4,528,166

RECOVERY OF GOLD AND/OR SILVER FROM CYANIDE LEACH LIQUORS ON ACTIVATED CARBON

Gloria McDougall, Johannesburg, South Africa, assignor to Sentrachem Limited, Marshalltown, Johannesburg, South Africa

Filed May 5, 1983, Ser. No. 491,648

Int. Cl.³ C01G *3/00;* C22B *11/00*

U.S. Cl. 423—23 **5 Claims**

1. A method of facilitating the recovery precious metals from cyanide liquors, which includes the steps of contacting the liquor with activated carbon, removing at least portion of the activated carbon, treating this with at least one member of a group consisting of a cation chosen from hydronium and metals and molecular complexes thereof, the member of the group having an affinity for the cyanide ion sufficiently high to cause precipitation of insoluable precious metal cyanide according to either of the equations

$$Au(CN)_2^- + M^{n+} \rightleftarrows AuCN + MCN \quad (3)$$

and

$$Au(CN)_2^- + ML_x \rightleftarrows AuCN + ML_{(x-1)+L} \quad (4)$$

in which M is a material selected from the group consisting of hydrogen and a metal and L is a ligand and x is the number of ligands; and recontacting the thus treated activated carbon with cyanide liquor.

4,528,167

SELECTIVE SOLVENT EXTRACTION USING ORGANOPHOSPHORUS AND CARBOXYLIC ACIDS AND A NON-CHELATING ALDEHYDE OXIME

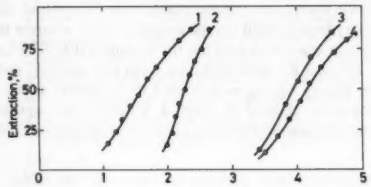
John S. Preston, Randburg, South Africa, assignor to Council for Mineral Technology, Randburg, South Africa

Continuation of Ser. No. 380,348, May 20, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 523,029

Claims priority, application South Africa, Nov. 3, 1981, 81/7583

Int. Cl.³ B01D *11/04;* **C01G** *51/00, 53/00*

U.S. Cl. 423—139 **8 Claims**



1. A process for the solvent extraction of nickel, selectively from cobalt from solutions containing such metals and having a pH of less than 5 comprising contacting said solution with a solvent extractant comprising an organophosphorus acid or a carboxylic acid capable of extracting the nickel and a non-chelating oxime of an aldehyde wherein the alpha carbon atom is primary or secondary.

4,528,168

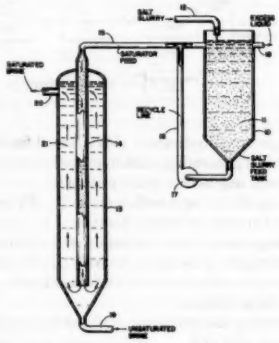
BRINE SATURATOR METHOD OF OPERATION

John D. Watson, Sr., Lake Jackson, and Billie B. Rhodes, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 14, 1983, Ser. No. 542,296

Int. Cl.³ C01B *9/00*

U.S. Cl. 423—184 **6 Claims**



1. A method for dissolving salt in an undersaturated brine solution to thereby saturate the brine solution, comprising the steps of:

storing a salt slurry composition in a holding tank;

drawing a stream of the salt slurry composition out of the holding tank and continuously recycling a first part of said stream back into said holding tank;

passing a second part of the salt slurry composition stream downwardly through a feed tube supported inside of an upright saturator column, and in coaxial relation to the saturator column;

discharging the salt slurry composition through the lower end of the feed tube, such that the slurry composition flows into an annulus defined between the saturator column and the feed tube;

flowing a stream of undersaturated brine into the saturator column to mix with the salt slurry composition being discharged from the feed tube;

causing the resulting mixture to move upwardly in the column annulus section, to dissolve the salt of the slurry composition in the undersaturated brine and thereby produce saturated brine; and

carrying the saturated brine out of the saturator column through a brine outlet line at the top of said column.

4,528,169

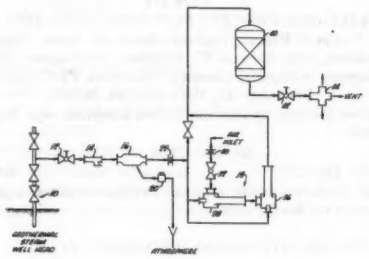
PROCESS TO ABATE GEOTHERMAL HYDROGEN SULFIDE

Phillip N. La Mori, Bakersfield, and Chien-Cheng J. Shih, Irvine, both of Calif., assignors to Occidental Research Corporation, Los Angeles, Calif.

Filed Aug. 29, 1983, Ser. No. 527,136

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—231 **35 Claims**



1. A process for removing hydrogen sulfide from geothermal steam comprising the steps of:

introducing an oxygen-containing gas into steam produced by a geothermal source, said steam comprising water vapor and hydrogen sulfide and having a temperature of at least about 250° F., said oxygen-containing gas being introduced into said steam in an amount to provide a molar ratio of oxygen-to-hydrogen sulfide in the steam and oxygen-containing gas to be less than about 1.5 to about 8.0;

contacting the steam and oxygen containing gas in a contacting stage with iron oxide supported by a carrier resistant to deterioration by said steam; and,

providing the steam and oxygen-containing gas in the contacting stage at a pressure between about 35 psia and about 130 psia to enable removal of a majority of the hydrogen sulfide from said steam and oxygen-containing gas.

4,528,170
WASTE GAS TREATMENT PROCESSES

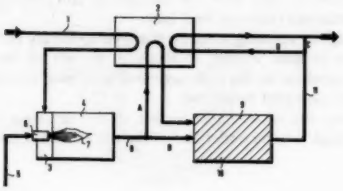
Heinz Meier zu Koecker, Berlin; Robert Walter, Muehlheim, and Torsten Schmidt, Berlin, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 473,149

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208767

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—245 11 Claims



1. A process for the treatment of a waste gas to reduce the concentration of primary and secondary pollutants which are capable of oxidation, comprising the steps of:

subjecting the exhaust gas in a first stage to thermal afterburning with the application of energy from an external source, in order to partially oxidize the gas; and

catalytically treating the partially oxidized gas from said first stage by exposure to a catalyst comprising a precious metal;

the concentration of primary pollutants being reduced to residual level not exceeding 300 mg/m³ and the concentration of secondary pollutants being reduced to a residual level not exceeding 100 mg/m³ of carbon monoxide, where the m³ are normal m³.

4,528,171
ZEOLITE AND PROCESS FOR PREPARING THE SAME

John L. Casci, Redcar, England; Barrie M. Lowe, Edinburgh, Scotland, and Thomas V. Whittam, Darlington, England, assignors to Imperial Chemical Industries, PLC, England

Filed Apr. 12, 1982, Ser. No. 367,615

Claims priority, application United Kingdom, Apr. 14, 1981, 8111851

Int. Cl.³ C01B *35/10*

U.S. Cl. 423—277 8 Claims

1. A synthetic zeolite material having a molar composition expressed by the formula:

$$0 \text{ to } 9M_2O{:}aY_2O_3{:}\text{at least } 100XO_2{:}0 \text{ to } 35H_2O$$

wherein M is a monovalent cation or 1/n of a cation of valency n, a is from 0 to 9, X is silicon and/or germanium, Y is one or more of aluminium, iron, chromium, vanadium, molybdenum, arsenic, antimony, manganese, gallium or boron, and H_2O is water of hydration additional to water notionally present when M is H, and having an X-ray pattern substantially as set out in Table 1.

4. A method of making a synthetic zeolite as defined in claim 1 or claim 2 which comprises reacting an aqueous mixture comprising at least one oxide XO_2, optionally at least one oxide Y_2O_3 and a propyltrimethylammonium compound, the mixture having the molar composition:

XO_2/Y_2O_3: at least 10

OH/XO_2: 0.1 to 6.0

$(M_1+Q^+)/XO_2$: 0.05 to 2.0

$Q^+/(M_1^+ + Q^+)$: 0.1 to 1.0

H_2O/XO_2: 1 to 100

M_2Z/H_2O: 10^{-4} to 0.5

wherein X and Y have the meanings given in claim 1, M_1 and M_2 are alkali metal, ammonium or hydrogen, Q is a propyltrimethylammonium compound and Z is a strong acid radical.

4,528,172
PROCESS FOR THE MANUFACTURE OF ZEOLITES

Hans-Peter Rieck, and Hans-Jürgen Kalz, both of Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,822

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3237916

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 9 Claims

1. A process for the manufacture of zeolites of the ZSM-5 type by heating an aqueous solution or suspension containing a silicon dioxide source, an organic phosphorus compound, and alkali metal hydroxide until crystallization occurs, wherein the organic phosphorus compound has the formula $OPR^1R^2R^3$, of which R^1, R^2, and R^3, independently from one another, each are alkyl or alkoxy having each from 2 to 10 carbon atoms.

9. A process as claimed in claim 1, wherein said aqueous solution or suspension additionally contains an aluminum oxide source.

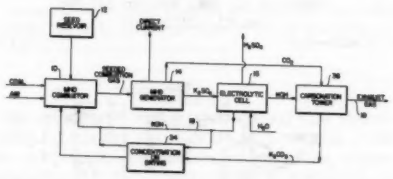
4,528,173
ELECTROLYTIC PROCESS FOR DESULPHURIZATION AND SEED REGENERATION IN COAL FIRED MAGNETOHYDRODYNAMIC (MHD) POWER GENERATION SYSTEMS

Thomas F. Seamans, Weston, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Aug. 17, 1979, Ser. No. 67,591

Int. Cl.³ H02K *45/00*; C01B *17/02*

U.S. Cl. 423—421 3 Claims



1. In a magnetohydrodynamic (MHD) coal fired alkali metal seeded electrical generating system, the process for desulphurization and seed regeneration comprising:

a. collecting alkali metal sulfate from the effluent gas of the combustion zone of said generator;

b. preparing an aqueous solution of said alkali metal sulfate and feeding the same to an electrolytic cell for converting alkali metal sulfate to sulphuric acid and alkali metal hydroxide solutions;

c. withdrawing said sulphuric acid and said hydroxide solutions from said cell;

d. contacting said hydroxide solution with said generator effluent gas, said gas containing a substantial amount of carbon dioxide, to produce an alkali metal carbonate solution; and

e. recycling said carbonate solution into the combustion zone of said generator.

4,528,174

METHOD FOR PREPARING HYDROGEN CHLORIDE FOR THE ETHYLENEOXICHLORINATION PROCESS

Ludwig Schmidhammer, Haiming/Marktl; Gerhard Dummer, Burgkirchen; Rudolf Strasser; Klaus Haselwarter, both of Burghausen; Hermann Klaus, Marktl, and Eduard Pichl, Mehring, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,530

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1983, 3331962

Int. Cl.[3] C01B *7/08*

U.S. Cl. 423—488 4 Claims

1. A method for purifying hydrogen chloride obtained in chlorination reactions and still containing up to 20 mole % elementary chlorine, to permit its direct use in an ethyleneoxichlorination process, comprising the steps of:

reacting said hydrogen chloride containing said chlorine with ethylene in the vapor phase at a temperature from 70° C.–150° C., a pressure of 1.5–5 bars absolute and with a molar excess of 5 to 20% of ethylene, said reaction being conducted in a reactor in the presence of a carrier catalyst comprising an iron-free transition metal chloride which is arranged so as to provide an activity profile of the catalyst which increases in the flow direction, while maintaining in said reactor space-flow rates of from 1,000 h^{-1} to 3,000 h^{-1} and gas-catalyst contact times of from 2 to 5 seconds; and

subjecting the reaction product after discharge from the reactor to partial condensation comprising at least one condensation step during which the temperature is maintained between −20° C. and −30° C.

4,528,175

PRODUCTION OF CHROMIUM (III) COMPOUNDS

James F. Walther, Skaneateles, N.Y., and John I. Choi, Worthington, Ohio, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 18, 1982, Ser. No. 442,550

Int. Cl.[3] C01G *37/00*

U.S. Cl. 423—492 19 Claims

1. A process for preparing chromium (III) salts of the formula:

$$Cr^{+3}{}_{3}X^{-m}{}_{n/2}$$

from an Alkali metal or Alkaline Earth metal chromate and/or dichromate or a mixture thereof, wherein;

X is halide;

m is 1; and

n is 6;

said process comprising the steps of:

(A) forming a reaction mixture comprising one or more of the said chromate and/or dichromate salts, water, a reducing effective amount of reducing agent, and at least a stoichiometric amount of an acid or the formula H_mX-m, and reacting said mixture for a time and at a temperature sufficient for chromium species in the +6 oxidation state to be reduced to the +3 oxidation state;

(B) adding to said mixture of step (A) an acid identical to that used in step (A), or an anhydrous species capable of forming such acid in situ in an amount such that said mixture contains an amount of said acid equal to or greater than the amount of Cr^{+3} and Alkali metal or Alkaline Earth metal in said mixture;

(C) cooling said reaction mixture thereby selectively precipitating salt of said Alkali metal or Alkaline Earth metal and the anion of said acid from said reaction mixture; and

(D) separating said precipitated salt from said reaction mixture thereby forming an aqueous solution of $Cr^{+3}{}_{3}X^{-m}{}_{n/2}$.

4,528,176

SODIUM ALUMINUM HYDRIDE PRODUCTION

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 15, 1982, Ser. No. 450,032

Int. Cl.[3] C01B *6/24*

U.S. Cl. 423—644 28 Claims

1. A process for the production of an alkali metal aluminum tetrahydride comprising pressure hydrogenating at about 750–2000 psig and about 120°–160° C. an alkali metal reactant and aluminum containing at least about 1000 parts by weight per million parts aluminum of an element selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, and uranium; in an innocuous reaction medium and in the presence of an alkali metal aluminate catalyst formed by heating an alkali metal aluminum tetrahalide or a lower alcohol under hydrogen pressure in the presence of an alkali metal and aluminum; and forming product alkali metal aluminum tetrahydride.

4,528,177

IMAGING AGENTS AND METHOD

Bryan B. Molloy, North Salem, and Mitchell I. Steinberg, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

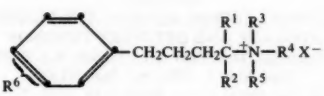
Filed Oct. 18, 1982, Ser. No. 435,137

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.[3] A61K *43/00, 49/00*

U.S. Cl. 424—1.1 9 Claims

1. A method of imaging animal organs comprising administering an effective amount of a compound of the formula



wherein:

R^1 is hydrogen or C_1–C_2alkyl;

R^2 is hydrogen or C_1–C_3 alkyl;

R^3 is C_1–C_4 alkyl or phenyl-C_1–C_4 alkyl;

R^4 is C_1–C_8 alkyl;

R^5 is C_6–C_{10} alkyl;

R^6 is a radioiodine atom; and

X is a therapeutically acceptable anion and scanning the organ region with a scinti-scanning means.

4,528,178

CHEMOTHERAPEUTIC AGENT AND TRACER COMPOSITION AND USE THEREOF

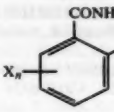
Albert L. Babb, Seattle, Wash., assignor to Biomedics, Inc., Santa Ana, Calif.

Division of Ser. No. 48,334, Jun. 14, 1979, Pat. No. 4,329,986. This application May 12, 1982, Ser. No. 377,383

Int. Cl.[3] G01N *33/48, 31/00;* A61K *33/00*

U.S. Cl. 424—7.1 12 Claims

1. A therapeutic and detecting composition suitable for extracorporeal treatment of whole blood comprising a water-soluble chemotherapeutic agent for sickle cell anemia said agent being selected from the group consisting of a water-soluble cyanate containing a reactive —NCO group, an alkyl acetimidate, and an alkyl adipimate, and a water-soluble fluorescable tracer means, said tracer being selected from the group consisting of an N-substituted benzamide represented by the formula



wherein R is a member of the group consisting of hydrogen and methyl, X is a member of the group consisting of halogen and alkoxy having no more than two carbon atoms, and n is an integer having a value of 0 or 1, and physiologically tolerable alkali metal salts thereof said chemotherapeutic agent and said tracer means being dialyzable from whole blood at rates that are a function of one another.

4,528,179

Patent Not Issued For This Number

4,528,180

DENTAL PREPARATION, ARTICLE AND METHOD FOR STORAGE AND DELIVERY THEREOF

Hans A. Schaeffer, 14 Pallant Ave., Linden, N.J. 07036

Filed Mar. 1, 1983, Ser. No. 471,188

Int. Cl.[3] **B65D** *35/22;* **A61K** *7/16, 7/18, 7/20*

U.S. Cl. 424—52 **6 Claims**

1. A combination of a collapsible tube article having flexible side walls and a composition consisting of a gel component and a paste component and contained in said article, said combination being suitable for use in combatting gum disease, said article comprising:

(a) a first compartment containing said gel, said gel comprising (i) 1–10% by volume of hydrogen peroxide, (ii) 0.05–1.2% by volume of a water dispersible copolymer of acrylic acid cross-linked with polyallyl sucrose; (iii) 0.1–1.5% by volume of a non-ionic cellulose gum stabilizer (iv) purified water and (iv) a neutralizing agent selected from the group consisting of sodium hydroxide, potassium hydroxide, triethanolamine, diisopropylamine and ammonia in an amount sufficient to raise the pH of said gel to within about 3–6 such that the gel liquifies immediately upon contact with a mildly alkaline environment containing a strong electrolyte, thereby causing the release of bactericidally effective amounts of nascent oxygen; said gel having sufficient viscocity to support itself on the bristles of a toothbrush and sufficient fluidity to be dispensed from said flexible sidewall tube article upon squeezing; said first compartment having an orifice for dispensing controlled amounts of said gel upon squeezing of said flexible sidewalls;

(b) a second compartment containing said paste, said paste comprising (i) 10–50% by weight of sodium bicarbonate; (ii) 1–6% by weight of a salt selected from the group consisting of NaCl and $MgSO_4$; (iii) 1–3% by weight of a thickener-stabilizer selected from the group consisting of cellulose gum magnesium aluminum silicate, and mixtures thereof; (iv) 5–30% by weight of a humectant selected from the group consisting of glycerin, sorbitol, polyethylene glycol and polypropylene glycol, (v) purified water and (vi) 1–40% by weight of a cleansing-polishing agent selected from the group consisting of $CaSO_4$, $Ca_3(PO_4)_2$ and hydrated aluminum oxide, and (viii) 0.1–2.5% by weight of sodium lauryl sulfate; said paste having sufficient viscocity to support itself on the bristles of a toothbrush and sufficient fluidity to be dispensed from said flexible sidewall tube by squeezing, said second compartment having an orifice for dispensing controlled amounts of said paste upon squeezing of said flexible sidewalls substantially simultaneously with the dispensation of said gel in substantially equal amounts; said first compartment orifice and said second compartment orifice being adapted to dispense said gel and said paste respectively at the same use point, said first and second compartments having a common wall portion and said orifices being substantially adjacent; said article affording the following advantages over the use of an H_2O_2, $NaHCO_3$ and NaCl combination formed by dipping a toothbrush in a supply of H_2O_2 followed by dipping said toothbrush in a paste consisting of $NaHO_3$, NaCl and H_2O_2:

(i) ready availability of premeasured bactericidally effective amounts of active H_2O_2 and $NaHCO_3$ sufficient to combat gum disease and effective against bacterial plaque;

(ii) more vigorous release of said O_2 due to the presence of said gel having a pH of about 3–6 on one hand and the presence of $NaHCO_3$, which is alkanine, and NaCl, which is a strong electrolyte, on the other hand;

(iii) improved penetration into gum tissues of nascent oxygen $NaHCO_3$ and NaCl and more intimate contact with tooth and gum surfaces; and

(iv) substantially smoother texture and a more palatable and pleasant taste.

4,528,181

DENTIFRICE CONTAINING DUAL SOURCES OF FLUORIDE

Anthony J. Morton, Ashton-under-Lyne; Kenneth Harvey, Wilmslow, and Harry Hayes, Thelwall, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 576,046

Int. Cl.[3] **A61K** *9/161, 9/18*

U.S. Cl. 424—52 **9 Claims**

1. A dentifrice comprising a liquid vehicle containing water in amount of at least about 3% by weight of said dentifrice, about 0.05–5% by weight of a gelling agent, a dual source of at least about 500 ppm of fluorine comprising sodium fluoride and sodium monofluorophosphate in which about 30–50% by weight of said fluoride is provided by said sodium fluoride, about 10–50% by weight of a polishing agent comprising a synthetic precipitated, amorphous silica gel having an average particle size of 1 to 30 microns and

(a) a surface area of 1 to 600 m^2/g,

(b) a pore volume of 0.05 to 0.5 cm^3/g,

(c) a product of surface area (in m^2/g) x pore volume (in cm^3/g less than or equal to 240,

(d) a calculated pore diameter of 1.5 to 2.5 nm, and

(e) a water content of less than 25% by weight,

a source of calcium corresponding to an amount to provide up to about 0.004% by weight of calcium ion in said dentifrice and about 0.1 to 2.5% by weight of an alkali metal phytate.

4,528,182

STABLE ANTIPLAQUE DENTIFRICE WITH IMPROVED FOAMING

John P. Curtis, Glen Gardner; Richard J. Crawford, Asbury, and Kathleen M. Yuhasz, Fords, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 13, 1983, Ser. No. 513,473
Int. Cl.[3] A61K *7/16, 7/22*
U.S. Cl. 424—54 14 Claims

1. A stable antiplaque dentifrice with improved foaming, comprising an effective amount within the range of about 0.01–5% of an antiplaque quaternary ammonium compound, at least 1.5% and up to about 2% betaine surfactant, about 20–30% of a humectant selected from the group consisting of polyethylene glycol, sorbitol, and mixtures thereof, and about 0.5–2% of a nonionic gelling agent, in an aqueous vehicle containing about 40–60% of a dental abrasive.

4,528,183

COMPOSITION FOR USE WITH INDOOR TANNING EQUIPMENT

Geoffrey W. A. Johnson, 19230 Southeast 48th Pl., Issaquah, Wash. 98027

Filed Apr. 25, 1983, Ser. No. 488,588
Int. Cl.[3] A61K *7/42, 35/78, 31/355, 47/00*
U.S. Cl. 424—59 2 Claims

2. A method of preparing the skin for exposure to ultraviolet radiation from the ultraviolet rays of indoor tanning equipment, comprising:

applying to the skin a skin preparation composition consisting essentially of:

90–96% by weight water;

2–5% by weight of a high molecular weight carboxy vinyl resin;

1–3% by weight triethanolamine as a neutralizing agent for the resin;

the remainder banana oil, aloe vera juice and vitamin E (dl-α-tocopherols); and

exposing the skin with the applied composition to ultraviolet radiation from indoor tanning equipment.

4,528,184

POLYMER-METAL COMPLEXES CONTAINING QUATERNARY NITROGEN ATOMS USED IN THE TREATMENT OF HYPERCHOLESTEREMIA

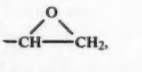
Masayasu Kurono; Osamu Nakagawa, both of Nagoya; Takafumi Iida, Kasugai; Yoshiro Ishiwata, Nagoya; Tomio Ogasawara, Nagoya, and Meiji Kuwayama, Nagoya, all of Japan, assignors to Kabushiki Kaisha Vitamin Kenkyuso, Kasugai, Japan

Filed Nov. 2, 1982, Ser. No. 438,487
Claims priority, application Japan, Nov. 4, 1981, 56-175741
Int. Cl.[3] A61K *31/74*
U.S. Cl. 424—79 22 Claims

1. A hypercholesteremia treating composition comprising an hypercholesterolemically effective amount of a polymer-metal complex in which the polymer component is a cross-linked polymer of a polyethylenepolyamine or polyethyleneimine and a bifunctional compound represented by the formula

Y—A—Z

where Y and Z are individually selected from the group consisting of $—CH_2X$, $—CH(OH)CH_2X$ and



A is selected from the group consisting of a single bond, $—(CH_2)m—$, $—CH_2—O—CH_2—$ and $—CH_2O—(CH_2)_k—O—CH_2—$, X is a chlorine, bromine or iodine atom, m is an integer of 1 to 3, and K is an integer of 1 to 4, and the metal component is a polyvalent metal ion coordinated in said cross-linked polymer, said complex having 20 to 80% of the total nitrogen atoms quaternized, or a non-toxic, pharmaceutically acceptable acid addition salt thereof, said composition being in the form of an orally administerable dosage of a powder, granule, capsule or tablet.

4,528,185

COPPER COMPLEXES, THEIR PREPARATION, THEIR USE IN CONTROLLING PLANT PESTS, AND AGENTS FOR SUCH CONTROL

Helmut Kraft, Wattenheim; Heinz Schumacher, Weinheim; Ernst-Heinrich Pommer; Dietrich Schlotterbeck, both of Limburgerhof, and Gregor Ley, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 252,800, Apr. 10, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 474,309
Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017123; Jun. 14, 1980, 3022432; Oct. 18, 1980, 3039409
Int. Cl.[3] A61K *31/78;* A01N *59/20, 33/02*
U.S. Cl. 424—81 6 Claims

1. A process for controlling plant pests, wherein the plant is treated with an effective amount of a composition comprising a carrier and/or diluent and a copper ammine salt with the anion of said salt being a polymer or copolymer consisting of from 60–100% acrylic acid and/or methacrylic acid and from 0–40% of a lower alkyl ester of acrylic acid or a lower alkyl ester of methacrylic acid, and wherein the term ammine includes complexes of ammonia and/or low molecular weight volatile amines.

4,528,186

METHOD OF PRODUCING HUMAN EPIDERMAL GROWTH FACTOR

Toyohiko Nishimura, Ashiya; Naomi Uchida, Takarazuka, and Hajime Hiratani, Sennan, all of Japan, assignors to Japan Chemical Research Co., Ltd., Kobe, Japan

Filed Jun. 9, 1983, Ser. No. 502,661
Claims priority, application Japan, Jun. 15, 1982, 57-103292
Int. Cl.[3] A61K *35/22, 37/02*
U.S. Cl. 424—99 8 Claims

1. In a method of producing a human epidermal growth factor from human urine wherein said urine is contacted with a hydrous aluminum silicate and wherein said epidermal growth factor is adsorbed on said hydrous aluminum silicate and subsequently eluted therefrom with an alkaline solution, the improvement which comprises the steps of:

(a) pretreating said urine to precipitate impurities by adjusting the pH to about 8–9 and separating said impurities,

(b) adding particles of an aluminum or magnesium silicate of the formula:

$$Z.2(\text{or } 6)SiO_2xH_2O$$

wherein Z is Al_2O_3 or 2MgO; x is the number of water molecules in each molecule of the compound as governed by the water content of the compound, to said urine under neutral to acid conditions to thereby adsorb said factor on said particles and,

(c) eluting said factor from said particles with an alkaline solution.

4,528,187

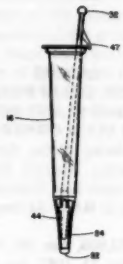
APPARATUS FOR COLLECTING AND MICROSCOPICALLY EXAMINING A SPECIMEN

William J. Truglio, 22 Palmer Dr., Sayville, N.Y. 11782

Continuation-in-part of Ser. No. 357,759, Mar. 12, 1982, Pat. No. 4,427,634. This application Nov. 18, 1983, Ser. No. 553,130

Int. Cl.[3] **B01L** *3/00;* **G01N** *1/28*

U.S. Cl. 422—102 **7 Claims**



1. Apparatus for collecting and microscopically examining a specimen, comprising:

a transparent tube having open and closed opposite ends in which tube a liquid may be centrifuged for concentrating constituents of said liquid to obtain a specimen for microscopic examination;

said tube having a frustoconical body to receive said liquid;

said tube having a tapered tip at its closed end in which said specimen may collect when said tube is centrifuged;

said tip having opposed, tapered, wide, flat transparent side walls and opposed, tapered, narrow end walls and a curve bottom wall integral with said wide, flat walls to define a narrow, tapered wall in which said specimen is held while being examined microscopically;

a paddle insert for supporting and retaining said specimen in said well while excess liquid is poured off from said tube, and while said specimen is being examined microscopically, said insert having an optically transparent paddle head, and a handle longer than the length of said tube, and integral with one end of said head to facilitate insertion of said paddle head into said well in said tube, said head being tapered to conform with said well and having ridges at lateral edges thereof and at said one end; and

wherein said paddle head is axially shorter than said well, to provide a pocket between a free end of said head and said end wall of said tip wherein highly condensed and compressed constituents of said specimen can collect.

4,528,188

POLYSACCHARIDE PS-A OBTAINED FROM BARRENWORT DERIVING FROM PLANTS BELONGING TO THE GENUS EPIMEDIUM, PROCESS FOR PREPARATION THEREOF AND PHYLACTIC AND IMMUNOSTIMULATING AGENTS COMPRISING SAID POLYSACCHARIDE PS-A EFFECTIVE COMPONENT

Susumu Mitsuhashi; Muneaki Takase; Sosuke Yasui, all of Tokyo; Ichiro Washizawa, Gunma, and Kimitomo Yoshioka, Tokyo, all of Japan, assignors to Zenyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00132, § 371 Date Dec. 28, 1982, § 102(e) Date Dec. 28, 1982, PCT Pub. No. WO82/03771, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 20, 1982, Ser. No. 456,027

Claims priority, application Japan, Apr. 30, 1981, 56-65892; Apr. 30, 1981, 56-65893; Nov. 27, 1981, 56-190202; Mar. 15, 1982, 57-40438

Int. Cl.[3] **A61K** *31/715;* **C08B** *37/00*

U.S. Cl. 424—116 **5 Claims**

1. A polysaccharide PS-A obtained from barrenwort derived from plants belonging to the genus Epimedium and having the following physicochemical properties (1) through (12):

(1) Elementary analysis: C=40.92, H=6.17, Ash=very small;

(2) Molecular weight: 75,000±25,000 (average molecular weight);

(3) Decomposition point: 205° C.;

(4) pH: 7.0(solution of 100 mg. of PS-A in 50 ml. of water);

(5) Specific rotatory power: $[\alpha]_D^{19}=23.6°$ (in H_2O, c=0.527);

(6) Infrared absorption spectrum: ν_{max}^{KBr} (cm^{-1})/3400, 2900, 1620, 1400, 1230, 1060;

(7) Ultraviolet absorption spectrum: Maximum absorption is not recognized in the range of 240–400 nm.;

(8) Qutward form: White or faint brown, amorphous powder;

(9) Solubility:

(a) Soluble in water;

(b) Insoluble in methanol, ethanol, acetone, ethyl acetate, diethyl ether, hexane or chloroform;

(10) Color reactions:

Positive to the following reactions: (a) anthrone-sulfuric acid reaction, (b) Molisch's reaction, (c) skatol reaction and (d) Bial's reaction; and

Negative to the following reactions: (a) ninhydrin reaction, (b) 2,4-DNP reaction, (c) Selivanoff's reaction, (d) naphthoresorcinol reaction and (e) carbazolsulfuric acid reaction;

(11) Component sugars: Arabinose and galactose;

(12) Homogeneity: Homogeneity is proved according to the ultracentrifugation, electrophoresis and gel filtration.

4,528,189

UROTENSIN PEPTIDES

Karl P. Lederis; Keith L. MacCannell, both of Calgary, Canada, and Jean E. F. Rivier, LaJolla, Calif., assignors to The Salk Institute For Biological Studies, San Diego, Calif.

Filed Feb. 3, 1983, Ser. No. 463,397

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/02*

U.S. Cl. 514—12 **11 Claims**

1. A pharmaceutical composition for lowering blood pressure in mammals or for changing regional blood distribution comprising an effective amount of synthetic UI having the formula: Y-R_1-Pro-Pro-Ile-Ser-Ile-Asp-Leu-Thr-Phe-His-Leu-Leu-Arg-Asn-Met-Ile-Glu-Met-Ala-Arg-Ile-Glu-Asn-Glu-Arg-Glu-Gln-Ala-Gly-Leu-Asn-Arg-Lys-Tyr-Leu-Asp-Glu-Val-NH_2 wherein Y is an acyl group having 7 or less carbon atoms or hydrogen and R_1 is Asn-Asp-Asp, Asp-Asp, Asp, Ala, or des-R_1, or a nontoxic addition salt thereof; and a pharmaceutically acceptable liquid or solid carrier therefor.

4,528,190

GRF ANALOGS IV

Wylie W. Vale, Jr., and Jean E. F. Rivier, both of La Jolla, Calif., assignors to The Salk Institute For Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 545,094, Oct. 25, 1983, , Ser. No. 532,170, Sep. 29, 1983, , and Ser. No. 457,862, Jan. 13, 1983,. This application May 18, 1984, Ser. No. 611,844

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/02*

U.S. Cl. 514—12 **20 Claims**

1. A synthetic peptide, or a nontoxic salt thereof, having the sequence: R_1-R_2-R_3-Ala-Ile-Phe-Thr-R_8-Ser-R_{10}-Arg-R_{12}-R_{13}-R_{14}-R_{15}-Gln-R_{17}-R_{18}-Ala-Arg-Lys-Leu-R_{23}-R_{24}-R_{25}-Ile-R_{27}-R_{28}-R_{29}-Gln-Gln-Gly-Glu-R_{34}-Asn-Gln-Glu-R_{38}-R_{39}-R_{40}-Arg-R_{42}-R_{43}-R_{44} wherein R_1 is Tyr, D-Tyr, Met, Phe, D-Phe, pCl-Phe, Leu, His or D-His having either a C^{α}Me or N^{α}Me substitution or being unsubstituted; R_2 is Ala, D-Ala or D-NMA; R_3 is Asp or D-Asp; R_8 is Ser, Asn, D-Ser or D-Asn; R_{10} is Tyr or D-Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{14} is Leu or D-Leu; R_{15} is Gly or D-Ala; R_{17} is Leu or D-Leu;

R_{18} is Tyr or Ser; R_{23} is Leu or D-Leu; R_{24} is His or Gln; R_{25} is Glu, Asp, D-Glu or D-Asp; R_{27} is Met, D-Met, Ala, Nle, Ile, Leu, Nva or Val; R_{28} is Asn or Ser; R_{29} is Arg or D-Arg; R_{34} is Arg or Ser; R_{38} is Gln or Arg; R_{39} is Arg or Gly; R_{40} is Ser or Ala; R_{42} is Phe, Ala or Val; R_{43} is Asn or Arg; R_{44} is a natural amino acid; provided however that any or all of the residues between R_{28} and R_{44}, inclusive, may be deleted and provided also that R_2 is D-NMA or R_{14} is D-Leu or R_{29} is D-Arg.

4,528,191
DISILACYCLOHEXANE DERIVATIVES IN ANTI-FERTILITY AGENTS

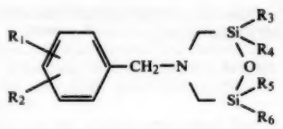
Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 545,060, Oct. 25, 1983, abandoned. This application Feb. 6, 1984, Ser. No. 577,523

Int. Cl.³ A61K *31/695*

U.S. Cl. 514—63 **7 Claims**

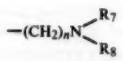
1. A method of inducing aspermatogenesis in male mammals in need of anti-fertility treatment which comprises administering to the mammal an anti-fertility effective amount of a compound of the formula:



where

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, trifluoromethyl, or

R_1 is



and

R_2 is hydrogen,

wherein

R_7 and R_8 are each independently hydrogen or lower alkyl having 1 to 2 carbon atoms,

n is 0 or 1, and

R_3, R_4, R_5 and R_6 each independently represent lower alkyl having 1 to 2 carbon atoms or

a pharmaceutically acceptable salt thereof.

4,528,192
PROCESS FOR PREPARING AN ANTITOXIC COMPOSITION

Jong Seong Kim, 508-2 Wolgye-dong, Seongbuk-Ku, Seoul, Rep. of Korea (131)

Continuation of Ser. No. 341,495, Jan. 21, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,096

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **2 Claims**

1. In a process for the preparation of a galenical composition including cut dry leaf or bark of oak tree (*Quercus spp.*) of the type employed as an astringent or mordant in Chinese herb medicine, the improvement comprising uniformly admixing a blend of 70 wt.% of said dry leaf or bark of said oak tree; 20 wt.% of cut dry leaf or root of juniper tree (*Juniperus utilis*); 2.5 wt.% of cut dry root of arrowroot (*Pueraria Thunber giana*); 5 wt.% of cut orange peel containing limonene and nesperidion; and 2.5 wt.% of licorice root (*Glycyrrhiza uralensis*) with water in a weight ratio of 1.3; cooking the first resulting mixture for 5 to 6 hours at a temperature of 40° to 60° C.; extracting the resulting cooked mixture to get a first extract; admixing said first extract with said first mixture in a weight ratio of 3:1; boiling in vacuum the second resulting mixture for 0.5 to 1.0 hour at 110° C. and then extracting said mixture in the presence of water to obtain a second extract; boiling in vacuum said extract for about 4 hours at 110° C. to afford a third extract; and dispersing 0.5 wt.% of glycerin into said extract at 800 to 1000 rpm, and recovering resulting composition useful for counteracting effects of toxic agricultural pesticides.

4,528,193
INFLAMMATION-PREVENTING PHARMACEUTICAL COMPOSITION OF ORAL ADMINISTRATION

Miklos Ghyczy; Adorjan Erdös, both of Cologne; Günter Heidemann, Geilenkirchen-Tripsrath, and Götz Ritzmann, Cologne, all of Fed. Rep. of Germany, assignors to A. Natterman & Cie. GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 266,216, May 22, 1981, Pat. No. 4,421,747, which is a division of Ser. No. 104,449, Dec. 17, 1979, Pat. No. 4,332,795. This application Nov. 7, 1983, Ser. No. 549,605

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856333

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ A61K *31/685*

U.S. Cl. 514—78 **10 Claims**

6. A method of alleviating inflammation in a mammal without gastric upset comprising orally administering to said mammal an effective inflammation-alleviating amount of a pharmaceutical composition comprising a phospholipid and a non-steroidal anti-inflammatory compound in a molar ratio ranging from about 0.1:1 to about 20:1, respectively.

4,528,194
2-(4-DIPHENYLMETHYLPIPERAZINYL)-1-PHENYL ALKANOL OR THEIR SALTS, A PROCESS FOR THEIR PRODUCTION AND A CEREBRAL CIRCULATION-IMPROVING DRUG

Mitsuo Masaki, Chiba, Japan, assignor to Nippon Chemiphar Co., Ltd., Tokyo, Japan

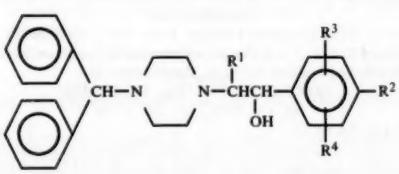
Filed Jul. 12, 1983, Ser. No. 513,093

Claims priority, application Japan, Dec. 2, 1982, 57-212036

Int. Cl.³ A61K *31/495;* **C07D** *241/04*

U.S. Cl. 514—255 **5 Claims**

1. A compound represented by the formula:



wherein R^1 is a hydrogen atom or a lower alkyl group; R^2 is a hydroxyl group, or a phenyl substituted lower alkoxy group, a lower alkoxy group having 1–5 carbon atoms or a lower alkenyloxy group having 3–5 carbon atoms; R^3 is a hydrogen atom, or a phenyl substituted lower alkoxy group, a lower alkoxy group having 1–5 carbon atoms or a lower alkenyloxy group having 3–5 carbon atoms; and R^4 is a hydrogen atom or a lower alkoxy group having 1–5 carbon atoms, provided that R^2 is a group other than the lower alkoxy group having 1–5 carbon atoms when both R^3 and R^4 are hydrogen atoms; or a pharmaceutically acceptable salt thereof.

5. A method of improving cerebral circulation in mammals which comprises administering to a mammal a therapeutically effective amount of the compound of claim 1.

4,528,195

IMIDAZOLE DERIVATIVES AND SALTS THEREOF, THEIR SYNTHESIS AND INTERMEDIATES AND PHARMACEUTICAL FORMULATIONS

Peter B. Thorogood, 114 Venner Rd., Sydenham, London, SE. 26, England

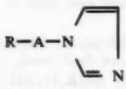
Division of Ser. No. 67,109, Aug. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 8,101, Jan. 31, 1979, abandoned, Ser. No. 952,796, Oct. 19, 1978, abandoned, and Ser. No. 952,774, Oct. 19, 1978, abandoned, said Ser. No. 952,796, is a continuation-in-part of Ser. No. 936,407, Aug. 24, 1978, abandoned, said Ser. No. 952,774, is a continuation-in-part of Ser. No. 936,406, Aug. 24, 1978, Pat. No. 4,284,641. This application Apr. 2, 1981, Ser. No. 250,481

Claims priority, application United Kingdom, Feb. 1, 1978, 03984/78

Int. Cl.[3] **A61K** *31/415, 31/455, 31/44, 27/00*

U.S. Cl. 514—396 **17 Claims**

1. A pharmaceutical formulation for use in inhibiting TXA_2 synthetase which comprises an effective TXA_2 synthetase inhibition amount of an imidazole of formula (IA)



(IA)

wherein

(i) A is a straight or branched alkylene group having 1, 2, 3 or 4 carbon atoms or a straight or branched alkenylene group having 2, 3 or 4 carbon atoms, and R is a
naphthyl,
tetrahydronaphthyl,
heterocyclyl,
arylthio,
arylalkylthio,
aryloxy,
arylalkyloxy,
alkyloxy,

(ii) A is an $—SO_2—$ group, and R is an aryl or a heterocyclyl group,

(iii) A is a chemical bond and R is a heterocyclyl group, or a pharmaceutically acceptable acid addition salt of such an imidazole, and a pharmaceutically acceptable carrier for the imidazole or salt thereof.

4,528,196

CHELATING AGENTS FOR THE TREATMENT OF IRON OVERLOAD

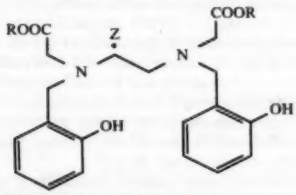
Colin G. Pitt, Research Triangle Park, N.C., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 23, 1981, Ser. No. 237,496

Int. Cl.[3] **C07C** *101/30, 31/24*

U.S. Cl. 514—533 **5 Claims**

1. Iron chelators which are orally effective selected from straight and branched chain alkyl diesters and mineral acid addition salts of bis(2-hydroxy-aryl-(alkylenediamine)-dicarboxylic acids according to the following formulae:



II

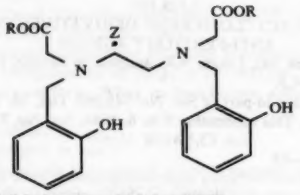
N,N'—bis(2-hydroxybenzyl)ethylenediamine-N,N—diacetic acid

R = methyl

Z = zero or a mineral acid addition salt selected from H_2SO_4, HCl, HNO_3, and H_3PO_4

active orally in mammals in dosages of 50–100 mg/kg/day to chelate and reduce iron overload in the plasma system.

3. A method of alleviating iron overload in plasma which comprises treating orally or I.P. a mammal with 50–100 mg/kg/day of a compound selected from one member of the group consisting of



II

N,N'—bis(2-hydroxybenzyl)ethylenediamine-N,N—diacetic acid

R = methyl

Z = zero or a mineral acid addition salt selected from H_2SO_4, HCl, HNO_3, and H_3PO_4.

4,528,197

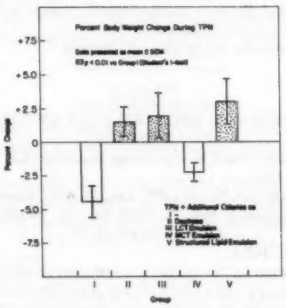
CONTROLLED TRIGLYCERIDE NUTRITION FOR HYPERCATABOLIC MAMMALS

George L. Blackburn, Cambridge, Mass., assignor to KabiVitrum AB, Stockholm, Sweden

Filed Jan. 26, 1983, Ser. No. 461,077

Int. Cl.[3] **A01N** *37/02*

U.S. Cl. 514—552 **11 Claims**



1. A method of enhancing protein anabolism in a hypercatabolic mammal, the method comprising parenterally administering to the mammal nutritionally sufficient sources for carbohydrates, amino acids and lipids, the lipid source comprising an emulsion of triglycerides which, on hydrolysis, yields both long chain fatty acids and medium chain fatty acids.

4,528,198

PREPARATION OF LOW CALORIE BEER WITH MALT EXTRACT FREE OF YEAST LETHAL FACTORS

Robert J. Mizerak, Waukesha; Geoffrey H. Bertkau, Brookfield; William F. Line, Glendale, and Etzer Chicoye, Wauwatosa, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Sep. 27, 1983, Ser. No. 536,950
Int. Cl.[3] C12C *11/04, 3/00*
U.S. Cl. 426—16 8 Claims

1. In the method of preparing a low calorie beer which comprises adding to the wort during fermentation an enzyme source containing a pullulanase to cleave the alpha-1,6 linkages of the limit dextrins in the wort to form alpha-1,4 dextrins which can be hydrolyzed to fermentable sugars by the alpha-1,4 carbohydrases which are present, the improvement which comprises employing as the enzyme source an aqueous extract of a highly diastatic malt, said extract having had yeast lethal factors removed and thereby being substantially free of yeast lethal factors.

4,528,199

SILAGE PRODUCTION FROM FERMENTABLE FORAGES

Nancy J. Moon, Griffin, Ga.; Lane O. Ely, Fort Collins, Colo., and E. M. Sudweeks, Kilgore, Tex., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Jan. 26, 1983, Ser. No. 461,001
Int. Cl.[3] A23K *1/00, 3/02;* C12R *1/25*
U.S. Cl. 426—53 9 Claims

1. A method for the production of silage from a fermentable forage substrate suitable for use as an animal feedstuff, comprising:

admixing *Lactobacillus plantarum* 2B bacteria with a fermentable forage substrate, said bacteria being added in an amount effective to lower the pH of said forage substrate to a pH at which said fermentable forage is stabilized and rendered substantially free of butyric acid producing bacteria; and

allowing fermentation to proceed under anerobic conditions until a silage stable to anaerobic storage is obtained.

4,528,200

MINERALIZED BREWED BEVERAGES

Henry E. Coleman, Salt Lake City, Utah, assignor to Spring Water Brew International, Salt Lake City, Utah

Filed Apr. 15, 1983, Ser. No. 485,201
Int. Cl.[3] A23F *5/00;* A23L *1/30*
U.S. Cl. 426—74 14 Claims

1. A method of producing a mineralized brewed coffee which comprises the steps of

(a) intimately admixing a particulate coffee with a composition comprising 1 to 25 parts by weight of a finely divided mineral source consisting of a naturally occurring hydrated aluminum silicate containing minerals selected from the group consisting of calcium, magnesium and iron and mixtures thereof, 1 to 40 parts by weight of a particulate water insoluble, water swellable flow retarding agent and 1 to 100 parts by weight of a particulate non-toxic coloring agent wherein the weight ratio of coffee to mineral source is between about 450:1 to 18:1, to form a particulate mixture;

(b) confining a predetermined amount of said particulate mixture by a filter medium through which said particulate coffee, particulate flow retarding agent and a majority of said finely divided mineral source cannot pass in solid form;

(c) subjecting said predetermined amount of said particulate mixture confined by said filter medium to a predetermined amount of hot water for a period of time sufficient to (1) cause said flow retarding agent particles in said mixture to swell and retard the flow of hot water through said mixture, (2) to extract into said hot water the desired hot water soluble components from said coffee and (3) to dissolve in said hot water said coloring agent and the hot water soluble mineral components from said mineral source; and

(d) passing said hot water containing said soluble coffee components and dissolved coloring agent and soluble mineral components through said filter medium along with a minimum amount of solids from said mineral source which are sufficiently small to pass through said filter medium at a rate permited by said water swelled flow retarding agent particles and finely divided mineral source to form a hot, mineralized brewed coffee beverage.

4,528,201

ALKALI-TREATED LECITHIN IN FATS

Edward R. Purves, Cincinnati, Ohio, assignor to The Procter & Gamble Co., Cincinnati, Ohio

Filed Jun. 20, 1983, Ser. No. 505,580
Int. Cl.[3] A23D *5/00, 5/02;* A23J *7/02*
U.S. Cl. 426—262 31 Claims

1. A process for retarding thermal darkening of fats containing lecithin comprising:

(a) adding at least 0.00005% by weight of a strong base selected from the group consisting of sodium hydroxide, magnesium hydroxide, and potassium hydroxide to a fat containing lecithin; and

(b) heating the mixture to at least about 200° F. (93° C.); such that thermal darkening of the fat during heating is retarded.

4,528,202

PROCESS FOR MAKING SHREDDED POTATO PRODUCTS

Martha Y. Wang, Glen Rock; Jane Michnowski, Little Ferry; Diane L. Hnat, Lodi, and Robert E. Ross, Wayne, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 2, 1983, Ser. No. 490,752
Int. Cl.[3] A21D *2/36, 6/00, 8/02;* A23L *1/216*
U.S. Cl. 426—550 30 Claims

1. A process for producing a ready-to-eat potato food product comprising:

(a) combining at least one source of potato starch with water to form discrete dough pieces without forming a dough mass, said pieces having a moisture content of from about 29% to about 50% by weight,

(b) tempering the pieces to distribute the water substantially throughout the pieces, and

(c) shredding the tempered pieces by passing them between counterrotating shredding rolls, at least one of which is grooved.

4,528,203

PROCESS PREPARATION OF SOLUBLE PROTEIN AND USE

Peter Harris, and Richard W. Yoell, both of Bedfordshire, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 403,588, Jul. 9, 1982,. This application Jul. 23, 1984, Ser. No. 632,698
Claims priority, application United Kingdom, Nov. 25, 1980, 8037701
Int. Cl.[3] A21D *10/00;* A23C *21/00*
U.S. Cl. 426—555 15 Claims

1. Process for the preparation of soluble protein by alkali treatment and concentration through ultra-filtration of whey, comprising the steps of:

(a) removing calcium phosphate from whey by adjusting the pH to a value not more than 6 at which calcium phoshate is rendered selectively separable by ultra-filtration from whey protein;

(b) selectively removing calcium phosphate in a permeate by ultra-filtration from a retentate comprising demineralized whey:

(c) subjecting the whey retentate to alkali treatment at a pH from 9.5 to 11.5 at which beta-lactoglobulin present selectively forms soluble aggregate having a molecular weight in excess of 100,000;
(d) decreasing the pH to within the range from 6.5 to 8; and
(e) concentrating the solution of soluble protein by ultra-filtration at any stage subsequent to said step b.

4,528,204

PREPARATION OF HYDROLYZED COLLAGEN-CONTAINING PRODUCTS FROM NON-GELLED LIQUID HYDROLYZED COLLAGEN CONCENTRATE AND GELLED PRODUCTS PREPARED THEREFROM

Joseph L. Shank, Matteson, Ill., assignor to Dynagel, Incorporated, Calumet City, Ill.

Division of Ser. No. 295,796, Aug. 27, 1981, Pat. No. 4,426,443. This application Jan. 12, 1984, Ser. No. 570,250
Int. Cl.³ A23L *1/04*
U.S. Cl. 426—576 **13 Claims**

1. A method of preparing a comestible, gelatin-containing product comprising the steps of:
providing a first volume of an ungelled aqueous concentrate having a gel-set temperature less than about 20° C. comprising about 10 to about 30 weight percent gelatin and an edible, non-acid lyotropic agent, the weight ratio of said gelatin to said lyotropic agent being about 1:0.3 to about 1:1.5, and the pH value of said concentrate being between about 3.5 and about 5.5;
providing the remaining product ingredients; and
admixing said first volume of gelatin concentrate with said remaining product ingredients and with at least an equal volume of an aqueous composition to dilute the concentrate and provide a gelatin concentration of about 0.25 to about 15 weight percent of the total composition, the diluted composition having a gel-set temperature higher than the gel-set temperature of said gelatin concentrate, and maintaining said diluted composition at a temperature not higher than the gel-set temperature of said diluted composition for a period of time sufficient for the gelatin therein to gel.

4,528,205

LOW CALORIE SYRUP

Lisa Turrisi, Ridgewood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,105
Int. Cl.³ A23L *1/09, 1/04*
U.S. Cl. 426—613 **13 Claims**

1. A low calorie edible syrup comprising:
(i) from about 10 to 43.3% sugar solids by weight of total syrup, in water;
(ii) from about 0.01 to 1% of alginate ester;
(iii) from about 0.01 to 1% of clarified xanthan gum; and
(iv) from about 0.01 to 1% of edible preservative wherein the ratio of alginate to xanthan gum ranges from 10:1 to about 1:1.

4,528,206

HARD CANDY COMPOSITION

Howard Kastin, 1262 Park St., Atlantic Beach, N.Y. 11509

Filed Dec. 20, 1983, Ser. No. 563,678
Int. Cl.³ A23G *3/00*
U.S. Cl. 426—660 **16 Claims**

1. A hard candy composition comprising:
(a) 10–90% by weight of a hydrogenated starch hydrolysate; and
(b) 90–10% by weight of at least one polymer of glucose or maltose.

4,528,207

PLATED DENTAL AMALGAM ALLOYS

Lewis B. Johnson, Charlottesville, Va., assignor to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 385,277, Jun. 4, 1982, abandoned. This application Dec. 12, 1983, Ser. No. 559,858
Int. Cl.³ C23C *3/00*; A61K *5/02*
U.S. Cl. 427—3 **10 Claims**

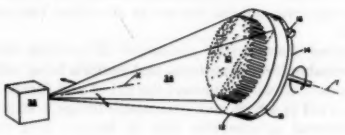
1. A method of preparing dental alloy particles coated with a silver-tin alloy, comprising:
codepositing silver and tin from a cyanide based plating solution containing silver and tin ions on a particulate metal substrate having a particle size sufficient to allow integral bonding between the alloy layer and the particulate substrate, said codeposition upon the metal substrate occurring by virtue of the electrochemical potentials of said silver and tin ions in solution and not by the application of a current to the solution.

4,528,208

METHOD AND APPARATUS FOR CONTROLLING ARTICLE TEMPERATURE DURING TREATMENT IN VACUUM

James K. Hirvonen; Andrew B. Wittkower, both of Rockport, Mass., and A. Stuart Denholm, Sherman, Conn., assignors to Zymet, Inc., Danvers, Mass.

Filed Oct. 13, 1983, Ser. No. 541,559
Int. Cl.³ B05C *13/00*
U.S. Cl. 427—35 **25 Claims**



1. A method of controlling the temperature of an article, the shape of which may vary, while exposing a selected portion of it to treatment under vacuum by an energetic beam,
said method comprising
providing, within a container, a heat conductive substance of selected depth having a solid rigid state under conditions of said treatment and having a molten state at a higher temperature below the minimum damage temperature of said article,
said substance being chemically nonreactive, nonwetting and nonadhesive at said higher temperature with a first portion of said article,
heating said heat conductive substance to said higher temperature to cause said substance to be in molten state,
temporarily holding said article in selected position to submerge said first portion of said article substantially below the surface of said molten heat conductive substance while a second portion of said article to be treated protrudes above said surface,
cooling said heat conductive substance to cause it to solidify about said immersed first portion of said article in intimate heat conducting and rigid supporting relationship therewith, with said second portion of said articles protruding above said surface, in position for exposure to said beam,
subjecting said exposed second portion under vacuum to said energetic beam for said treatment while controlling the temperature of said article by heat transfer via said intimately engaged, rigid supporting substance, and, thereafter following said treatment,
reheating said rigid substance to said higher temperature to cause said substance to be in molten state, and
removing the treated article therefrom.

13. An apparatus for controlling the temperature of an arti-

cle, the shape of which may vary, while a portion of said article is exposed to a predetermined treatment by an ion energetic beam,

said apparatus comprising:

a container, and

within said container, a heat conductive substance of selected depth having a solid, rigid state under the conditions of said treatment and having a molten state at the temperature below the minimum damage temperature of said article,

said substance being chemically nonreactive, nonwetting and nonadhesive at said higher temperature with a first, support portion of said article,

said contained substance being adapted, in molten state to submersibly receive said first support portion of said article substantially below the surface of said molten heat conductive substance while leaving a second portion of said article to be treated exposed above said surface in selected position,

said substance being further adapted, upon cooling, to solidify about said immersed first, support portion of said article in intimate heat conducting and rigid supporting relationship therewith, with said second portion of said article protruding above said surface, in selected position for exposure to said beam,

whereby, said rigid heat conductive substance permits control of the temperature and accurate angular positioning of said article during treatment with said energetic ion beam in vacuum.

4,528,209

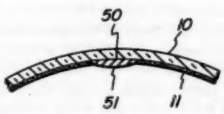
USE OF AMALGAMS IN SOLENOIDAL ELECTRIC FIELD LAMPS

John M. Anderson, Scotia, and Peter D. Johnson, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 399,552, Jul. 19, 1982, Pat. No. 4,499,400, which is a continuation-in-part of Ser. No. 214,903, Dec. 10, 1980, abandoned, which is a division of Ser. No. 954,411, Oct. 25, 1978, Pat. No. 4,262,231. This application Sep. 4, 1984, Ser. No. 647,325

Int. Cl.³ H01J *61/28*

U.S. Cl. 427—67 **1 Claim**



1. In a method of manufacturing solenoidal electric field discharge lamps having a glass surface the steps of wetting said glass surface with metallic wetting agent selected from the group consisting of indium and gallium; and disposing a lead-bismuth-tin alloy on said wetting agent.

4,528,210

METHOD OF MANUFACTURING A RADIATION EXCITED INPUT PHOSPHOR SCREEN

Takashi Noji, Odawara; Norio Harao, Ayase, and Yoshiharu Obata, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 272,764, Jun. 11, 1981, Pat. No. 4,437,011. This application Dec. 28, 1983, Ser. No. 566,227

Claims priority, application Japan, Jun. 16, 1980, 55-80146; Feb. 17, 1981, 56-219341

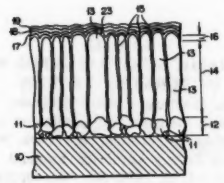
Int. Cl.³ B05D *5/06, 5/12*

U.S. Cl. 427—70 **7 Claims**

1. A method for manufacturing a radiation excited input phosphor screen comprising:

maintaining a substrate with a substantially smooth surface at a temperature of 20° to 150° C.;

evaporating a phosphor material in an atmosphere held at a degree of vacuum of 1×10^{-3} to 1×10^{-2} Torr to deposit a first phosphor layer including phosphor crystal particles having a mean diameter of 15 μm or less on said smooth surface of said substrate; and



evaporating an alkali halide phosphor material in an atmosphere held at a degree of vacuum of 1×10^{-4} to 1×10^{-2} Torr to deposit on said crystal particles of said first phosphor layer a second phosphor layer including columnar crystals grown to a thickness which is 10 or more times that of said first phosphor layer, with fine spaces extending therebetween to the tops of said columnar crystals.

4,528,211

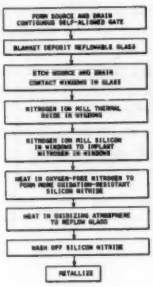
SILICON NITRIDE FORMATION AND USE IN SELF-ALIGNED SEMICONDUCTOR DEVICE MANUFACTURING METHOD

Jayant K. Bhagat, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 4, 1983, Ser. No. 548,712

Int. Cl.³ H01L *21/318*

U.S. Cl. 427—88 **3 Claims**


FORM SOURCE AND DRAIN CONTIGUOUS SELF-ALIGNED GATE
BLANKET DEPOSIT REFLOWABLE GLASS
ETCH SOURCE AND DRAIN CONTACT WINDOWS IN GLASS
NITROGEN ION MILL THINNING, GLASS IN WINDOWS
NITROGEN ION MILL SILICON IN WINDOWS TO IMPLANT NITROGEN IN WINDOWS
HEAT IN OXYGEN-FREE NITROGEN TO FORM MORE OXIDATION-RESISTANT SILICON NITRIDE
HEAT IN OXIDIZING ATMOSPHERE TO REFLOW GLASS
WASH OFF SILICON NITRIDE
METALLIZE

1. A new method of forming and using a silicon nitride coating on a silicon surface portion comprising the steps of coating a silicon surface part with a layer of silicon oxide prior to heating the silicon body in an oxidizing atmosphere, wet or dry etching a window area in the silicon oxide layer over a selected portion of the silicon surface to at least thin it enough to be useful as a mask, ion milling the silicon oxide layer for at least about 20 seconds with nitrogen ions to remove any residual silicon oxide in the window area and to coincidentally implant nitrogen atoms in an ion milled silicon surface portion to a depth of up to about 100 angstroms using silicon oxide layer portions outside the window area as a mask, heating the ion milled silicon surface portion in an atmosphere consisting essentially of nitrogen, effective to produce a silicon nitride coating on the milled silicon surface portion that is useful in preventing the silicon surface portion exposed in the window area from oxidizing when other portions of the silicon surface are oxidized, then heating the silicon body in an oxidizing

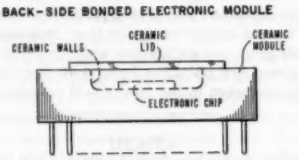
atmosphere, and thereafter selectively removing the silicon nitride coating by means of an etchant that preferentially attacks silicon nitride rather than silicon oxide.

4,528,212

COATED CERAMIC SUBSTRATES FOR MOUNTING INTEGRATED CIRCUITS

James A. Cairns, Wantage, United Kingdom, and James F. Ziegler, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, New York, N.Y. and United Kingdom Atomic Energy Authority, England

Filed Jul. 22, 1982, Ser. No. 400,813
Int. Cl.³ A23L *1/216*
U.S. Cl. 427—96 **8 Claims**



1. A method of modifying and controlling the surface texture of a ceramic surface on an integrated circuit chip carrier, said method comprising the steps of:

coating the ceramic surface of an integrated circuit chip carrier to be modified with a ceramic precursor liquid dispersion of particulates wherein the particulates have a particle size in the range of from about 0.05 to about 5 μm, the surface texture of the modified surface being controlled by providing that the particle size of the particulates is within said range of from about 0.05 to about 5 μm;

removing said liquid from said dispersion of particulates on said ceramic surface;

firing said coating to obtain a stable union or bond of said coating with said ceramic surface.

4,528,213

EMI/RFI SHIELDING COMPOSITION

Jordan R. Nelson, Pennington, and Bruce F. Bogner, Mt. Holly, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 22, 1983, Ser. No. 554,339
Int. Cl.³ B05D *5/12;* **H01B** *1/06*
U.S. Cl. 427—105 **9 Claims**

1. A homogeneous composition suitable for shielding an electronic device from electromagnetic and radio frequency interference consisting of: from about 64 to about 78 percent by weight of a vinyl chloride-based resin; a conductive component comprising from about 10 to about 17 percent by weight of finely divided conductive carbon black and from about 5 to about 15 percent by weight of graphite, and up to about 10 percent by weight of additives compatible therewith comprising at least a stabilizer and a lubricant.

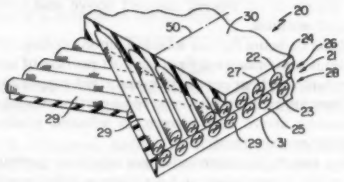
8. A method of shielding an electronic device from electromagnetic and radio frequency interference comprising coating the enclosure of said device where shielding is required with an effective amount of the composition of claim **1**.

4,528,214

POLYMERIC PRODUCT HAVING A FABRIC LAYER MEANS AND METHOD OF MAKING THE SAME

Delmar D. Long, Rock Hill, S.C., and James D. Hill, Jr., Turnback Township, Lawrence County, Mo., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 486,650, Apr. 20, 1983,. This application Apr. 9, 1984, Ser. No. 598,107
Int. Cl.³ B05C *3/107;* **B05D** *3/02*
U.S. Cl. 427—173 **21 Claims**



1. In a method of making a polymeric product having a fabric layer means provided with opposed sides and at least one polymeric means secured to said fabric layer means, said fabric layer means having been stretched in a generally transverse direction relative to the longitudinal axis of said fabric layer means, the improvement comprising the steps of forming said fabric layer means to comprise a first substantially planar layer of thread means and a second substantially planar layer of thread means with each layer of thread means comprising a plurality of strand means disposed in a non-interconnected generally straight line side-by-side parallel relation and with said first layer of thread means having said polymeric means applied thereto in liquid form and being disposed in superimposed relation against said second layer of thread means in such a manner that at least a part of said applied polymeric means in liquid form is disposed against said thread means of said second layer whereby said thread means of said first layer are not woven with said thread means of said second layer, said step of forming said fabric layer means also comprising the steps of disposing said strand means of said first layer to cross said axis at an acute angle relative thereto and disposing said strand means of said second layer to cross said axis at an obtuse angle relative thereto whereby said strand means of said second layer are disposed at an angle relative to said strand means of said first layer, and thereafter, forming said polymeric means to effectively be the sole securement means securing said thread means of said first layer to said thread means of said second layer and thereby impart its flexible characteristic to said securement means between said thread means of said first and second layers by first substantially simultaneously stretching said superimposed layers in said transverse direction and then drying said applied polymeric means to at least a condition thereof that tends to hold said strand means of said layers in said generally side-by-side parallel relation and said layers in said superimposed relation.

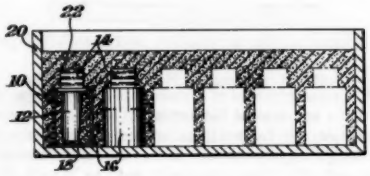
4,528,215
DIFFUSION ALUMINIZING OF COBALT-BASE SUPERALLOYS

Alfonso L. Baldi, Wynnewood, Pa., and Victor V. Damiano, Pennsauken, N.J., assignors to Alloy Surfaces Company, Inc., Wilmington, Del.

Division of Ser. No. 306,590, Sep. 28, 1981, abandoned, and Ser. No. 104,571, Dec. 17, 1979, , which is a division of Ser. No. 781,134, Mar. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 576,981, May 13, 1975, Pat. No. 4,041,196, which is a continuation-in-part of Ser. No. 507,126, Sep. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 466,908, May 3, 1974, Pat. No. 3,958,047, which is a continuation-in-part of Ser. No. 328,378, Jan. 31, 1973, Pat. No. 3,867,184. This application Nov. 7, 1983, Ser. No. 548,937

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—252 1 Claim



1. In the method of forming a relative ductile aluminide protective coating on a cobalt-base superalloy workpiece, the improvement according to which the workpiece is subjected to the high temperature action of a halide-activated powder pack consisting essentially of nickel and an inert diluent in an otherwise essentially inert atmosphere to cause the workpiece to lose about 3 to about 75 milligrams of weight per square centimeter of its surface, and subjecting the resulting workpiece to an aluminum diffusion coating treatment.

4,528,216
PROCESS FOR FORMING HEAT-RESISTANT RESIN FILMS OF POLYIMIDE AND ORGANOSILICIC REACTANTS

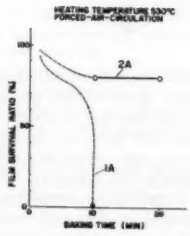
Ken Ogura, and Hiroshi Nakaboh, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,365

Claims priority, application Japan, Feb. 24, 1983, 58-28586; Sep. 19, 1983, 58-171193; Sep. 22, 1983, 58-174105; Sep. 22, 1983, 58-174106

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—387 7 Claims



1. A process for forming heat resistant resin films comprising the steps of admixing a polyimide resin precursor solution with an organosilicic compound solution, coating a silicon substrate with the resulting admixture, and subjecting said silicon substrate coated to heat treatment.

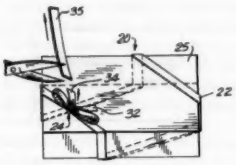
4,528,217
ADJUSTABLE PULL BOW

George Spathis, Deerfield, Ill., and Anita C. Korrasik, Glen Head, N.Y., assignors to Clevepak Corporation, Purchase, N.Y.

Filed Sep. 19, 1984, Ser. No. 652,308

Int. Cl.³ D04D *7/10*

U.S. Cl. 428—5 6 Claims



1. An adjustable pull bow made of a single length of flexible material comprising a bow portion and an adjustable loop portion, the bow portion comprising a right bow loop and a left bow loop, a center knot between the right and left bow loops, a stationary tail, and an adjustable tail wherein the adjustable loop portion can be varied in size by pulling the adjustable tail through the center knot of the bow portion.

4,528,218
DISPOSABLE DEVICE FOR SELF-HEATING OR SELF-COOLING OF DRINKS OR FOODSTUFFS BY AN EXOTHERMIC OR ENDOTHERMIC REACTION

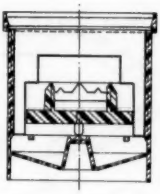
Claudio Maione, Naples, Italy, assignor to LA "GROG" S.r.l., Naples, Italy

Filed Nov. 29, 1983, Ser. No. 556,200

Claims priority, application Italy, Dec. 7, 1982, 49636 A/82

Int. Cl.³ B65D *25/08*

U.S. Cl. 428—35 8 Claims



1. A disposable container for heating or cooling a liquid or solid food product contained therein by exothermic or endothermic reaction, characterized in that it comprises a metal container formed with an inner and outer room by a partition, the outer room holding foodstuff or liquid for ingestion, and the inner room holding a solid and a liquid chemical reaction agent; the inner room being further partitioned into two compartments one directly above the other, separated by a diaphragm, the upper compartment containing said liquid reactant and the lower compartment containing a non-stationary inner breaker and said solid reactant, said solid reactant being placed on top of said non-stationary inner breaker;

a plastic insulating container firmly attached to and enveloping outer perimeters of said metal container;

an outer breaker means within said plastic container but external to said metal container for causing said non-stationary inner breaker to pierce through said diaphragm thus moving said solid reactant into said upper compartment so as to cause instantaneous and thorough mixing of the solid and liquid reactants.

4,528,219

MULTI-LAYER PLASTIC LAMINATE STRUCTURE

Muneki Yamada, Fujisawa, and Akira Sakamoto, Yokohama, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,082
Claims priority, application Japan, Jan. 26, 1983, 58-9966
Int. Cl.³ B65D *1/00;* **B32B** *27/08, 27/28, 27/36*
U.S. Cl. 428—35 **15 Claims**

1. A multi-layer plastic structure comprising a layer of a polyester composed mainly of ethylene terephthalate units or butylene terephthalate units and a gas barrier layer containing an olefin-vinyl alcohol copolymer, said two layers being laminated together through a layer of a thermoplastic resin adhesive containing recurring ester groups and recurring amide groups wherein said ester groups are at a concentration of 53–990 millimoles per 100 g of the resin and said amide groups are at a concentration of 45 to 840 millimoles per 100 g. of the resin.

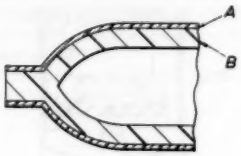
2. A hollow-formed vessel composed of a multi-layer plastic structure as set forth in claim 1.

4,528,220

PLASTIC BAGS FOR MEDICAL SOLUTIONS AND BLOOD

Charles C. Hwo, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1984, Ser. No. 578,739
Int. Cl.³ B65D *30/08*
U.S. Cl. 428—35 **19 Claims**



1. A package for containing blood and/or intravenous solutions, which comprises:

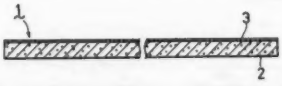
an outer layer blend of from about 50% by weight to about 95% by weight propylene-ethylene copolymer or propylene homopolymer, where the ethylene content of said propylene-ethylene copolymer comprises from about 0% by weight to about 8% by weight of said propylene-ethylene copolymer, and from about 5% by weight to about 50% by weight butene-1-ethylene copolymer, where the ethylene content of said butene-1-ethylene copolymer comprises from about 2% by weight to about 8% by weight of said butene-1-ethylene copolymer; and an inner layer blend of from about 10% by weight to about 40% by weight propylene-ethylene copolymer or propylene homopolymer, where the ethylene content of said propylene-ethylene copolymer comprises from about 0% by weight to about 8% by weight of said propylene-ethylene copolymer, and from about 60% by weight to about 90% by weight butene-1-ethylene copolymer, where the ethylene content of said butene-1-ethylene copolymer comprises from about 2% by weight to about 8% by weight of said butene-1-ethylene copolymer, and where the thickness ratio of said inner layer to said outer layer is from about 1:1 to about 6:1.

4,528,221

POLYSTYRENE FOAMED SHEET SUITABLE FOR FORMING

Nobuyuki Komatsuzaki; Masahiro Tsubone, and Bon Machida, all of Koga, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed May 10, 1983, Ser. No. 493,290
Claims priority, application Japan, May 11, 1982, 57-79534
Int. Cl.³ B32B *1/02, 27/06, 27/30*
U.S. Cl. 428—35 **22 Claims**



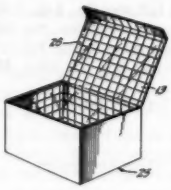
7. A container formed of a laminate of a polystyrene foamed sheet and a non-foamed film laminated on at least one surface of the polystyrene foamed sheet, said polystyrene foamed sheet comprising a polystyrene resin as the base resin which contains 1 to 30 wt% of a rubber component and 1 to 20 wt% of a filler based on said polystyrene, having a bulk density of 0.13 to 0.7 g/cm^3, a thickness of 0.4 to 3.0 mm, a stretch ratio less than 1.25 and a quantity of residual gas of a blowing agent less than 0.3 mole/kg.

4,528,222

CONDUCTIVELY PRINTED FLEXIBLE SHEET MATERIAL

Ray M. Rzepecki, North Scituate, R.I., and Victor H. Weiss, Bridgeport, Conn., assignors to Pervel Industries, Inc., Plainfield, Conn.

Continuation-in-part of Ser. No. 257,242, Apr. 24, 1981, abandoned. This application Dec. 13, 1982, Ser. No. 449,401
Int. Cl.³ B32B *3/22, 3/24;* **B65D** *73/02, 85/42*
U.S. Cl. 428—35 **7 Claims**



1. A static-dissipative electrostatically shielding container comprising an enclosure of size to fully contain an electronic circuit component or the like, said enclosure being fabricated from composite flexible sheet material, wherein the sheet material comprises inner and outer layers of transparent material characterized by relatively high resistivity, with an interposed printed open matrix of electrically conductive ink on at least one of the two confronting adjacent surfaces of said inner and outer layers, said matrix providing first and second intersecting sets of spaced plural conductive paths, whereby the inner layer provides anti-spark protection as between the conductive matrix and an enclosed circuit component, and the outer layer provides anti-spark protection as between the conductive matrix and a conductive source of voltage external to the container.

4,528,223
COMPOSITE FIBROUS PRODUCT

Tetsuo Kumazawa; Hiroaki Doi, both of Ibaraki; Yasuo Miyadera; Atsushi Fujioka, both of Shimodate, and Tadashi Nagai, Mooka, all of Japan, assignors to Hitachi, Ltd.; Hitachi Chemical Co., Ltd. and Fuji Fiber Glass Co., Ltd., all of Tokyo, Japan

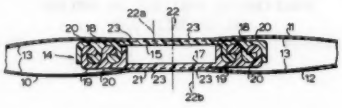
Filed Oct. 26, 1981, Ser. No. 315,057
Claims priority, application Japan, Oct. 27, 1980, 55-149465
Int. Cl.³ D02G *3/4, 3/18, 3/44;* D03D *15/00*
U.S. Cl. 428—36 **13 Claims**

1. A composite fibrous product having a great reinforcing effect and high rigidity comprising combination yarn obtained by mix-twisting aromatic polyamide continuous filament yarn and continuous glass yarn; said aromatic polyamide being selected from the group consisting of poly(p-phenylene terephthalamide), poly(p-benzamide) and copolymers of monomer units thereof.

4,528,224
METHOD OF MAKING MULTIPLE RECLOSABLE BAG MATERIAL

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,619
Int. Cl.³ B32B *7/08*
U.S. Cl. 428—36 **14 Claims**



1. A method of making multiple reclosable bag material, comprising:

advancing from a supply source bag wall film as a continuous ribbon and providing confronting colinear wall panel portions with surfaces facing toward one another and of a width sufficient to provide two continuous bag strip sections;

feeding a continuous length of double separable fastener assembly from a supply source into corunning relation between said wall panel portions and intermediate and spaced from the longitudinal sides of said wall panel portions, and wherein said fastener assembly has two coextensive webs which carry along confronting opposite longitudinal margins respective complementary resiliently flexible fastener profile sets which are separably interlocked and with substantial width areas of the webs intervening between the profile carrying margins on each of the webs and having respective oppositely facing base surfaces;

placing said web base surfaces respectively in laminar relation to said facing surfaces on superjacent parts of the bag wall film panel portions;

and permanently securing into a laminate each of said superjacent parts of said wall panel portions and only intermediate areas of the webs and leaving the profile carrying marginal portions of each of the webs free from the panel portion surfaces;

so that by longitudinally separating said laminates between and spaced from said fastener profile sets into separate bag making strips, each strip will have thereon one of said fastener profile sets and each strip will be provided with multi-layer pull flanges formed from said laminates and with both of the fastener carrying margins free from the panel portion surfaces on both wall panel portions of each strip.

11. A multiple reclosable bag material, comprising:

bag wall film in a continuous ribbon and providing confronting colinear wall panel portions with surfaces facing toward one another and of a width sufficient to provide two continuous bag strip sections;

a continuous length of double separable fastener assembly in colinear relation between said wall panel portions and intermediate and spaced from the longitudinal sides of the wall panel portions;

said fastener assembly having two coextensive webs which carry along confronting opposite longitudinal margins respective complementary resiliently flexible fastener profile sets which are separably interlocked and with substantial width areas of the webs intervening between the profile carrying margins on each of the webs and having respective oppositely facing base surfaces;

said web base surfaces being respectively in laminar relation to said facing surfaces on superjacent parts of the bag wall film panel portions;

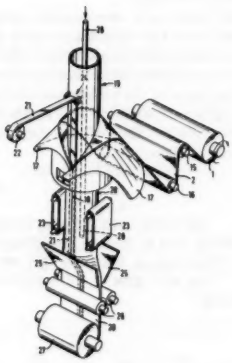
and only intermediate areas of the webs being permanently secured into a laminate with superjacent parts of said wall panel portions and the profile carrying marginal portions of each of the webs being free from the panel portion surfaces;

so that the laminate is adapted to be longitudinally separated between and spaced from the fastener profile sets into separate bag making strips wherein each of the strips will have thereon one of said fastener profile sets and each strip will be provided with multi-layer pull flanges formed from said laminate and with both of the fastener carrying margins free from the panel portion surfaces on both wall panel portions of each strip.

4,528,225
EASILY PEELABLE SAUSAGE CASING HAVING A GLUED SEAM, PROCESS FOR ITS MANUFACTURE, AND ITS USE

Elfriede Hutschenreuter, Bad Schwalbach; Klaus Andrae, Zornheim, and Klaus Heyse, Bad Soden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,026
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228514
Int. Cl.³ F16L *11/00*
U.S. Cl. 428—36 **17 Claims**



1. A sausage casing, comprising:

a cellulose film curved around the longitudinal axis of said film so that the edges of said film form a seam parallel to the longitudinal axis;

a smoke-permeable adhesive-containing layer in the region of said film edges consisting essentially of a substantially water-insoluble condensation product of a polyamide-polyamine, an aliphatic polyamine or polyamide with a

bifunctional halohydrin or a derivative thereof, said condensation product joining said film edges at said seam; and

a coating on the inside surface of said curved film of an oily emulsion comprising (a) a first component selected from a water-soluble cellulose ether or water-soluble modifed starch, (b) a second component comprising at least one oil selected from the group consisting of a triglyceride mixture of saturated fatty acids with carbon chain lengths of about 4 to 14 carbon atoms, mineral oil, paraffin oil, natural oil and silicone oil, and (c) an emulsifier, said second component being present in an amount from about 15 to 100 times greater than said first component.

4,528,226

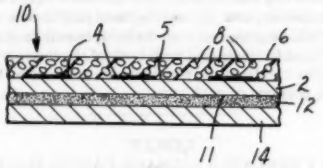
STRETCHABLE MICROFRAGRANCE DELIVERY ARTICLE

Norman P. Sweeny, North Oaks, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Oct. 11, 1983, Ser. No. 540,500

Int. Cl.³ A61L *9/04;* **B01J** *13/00;* **D01F** *1/02;* **D04H** *1/04*

U.S. Cl. 428—40 **14 Claims**



14. A method for rupturing microcapsules contained in an article comprising the steps of:

(a) providing an article containing microscopic rupturable capsules, which capsules upon rupture release core material, said article comprising:

(1) a support layer comprising printed sheet material capable of undergoing plastic deformation, and

(2) a coating layer comprising microscopic, rupturable capsules with releasable core material therein in a binder coated on at least one surface thereof;

said article exhibiting

a. a yield point on a stress-strain curve of less than 225 kg/cm^2 for a 127 micrometer thick material,

b. a difference in elongation at the yield point compared to the breaking point of at least 5.0 percent, and

c. an elongation at the yield point of less than 25 percent;

(b) applying tensile stress to said article sufficient to cause rupture of at least same of said capsules, so as to release core material therefrom.

4,528,227

MOSAIC STYLE ARTWORK

Jean Frechtmann, 400 E. 56th St., New York, N.Y. 10022

Filed Apr. 4, 1983, Ser. No. 482,044

Int. Cl.³ B29C *5/08;* **B29D** *9/00*

U.S. Cl. 428—49 **4 Claims**

1. Mosaic artwork including a decorative motif, manufactured by a casting method employing a mold having a mosaic pattern of engravings which define mosaic tile cavities and the decorative motif, the mold cavities including base surfaces which have spherical depressions which provide a pearlized relief casting finish, comprising the steps of:

(a) casting a first layer of thermosetting material in the engraved mold, the first thermosetting layer having a depth less than the height of the mosaic pattern mold engravings;

(b) curing the first mold layer to a gel consistency;

(c) brushing the top surfaces of the first thermosetting layer to remove surface films formed in the curing process;

(d) casting a second layer of thermosetting material in the engraved mold, the second layer having sufficient depth to overlie the mosaic pattern mold engravings, the second layer also having a different coloration from that of the first thermosetting layer;

(e) positioning a strengthening member on the exterior surface of the second thermosetting layer;

(f) curing the first and second mold layers to cured strength;

(g) demolding the thermoset materials to provide a relief cast having distinct mosaic style impressions, decorative motif, and pearlized ornamentation of the mold; and

(h) applying a porcelain glaze to the front surface of the demolded casting.

4,528,228

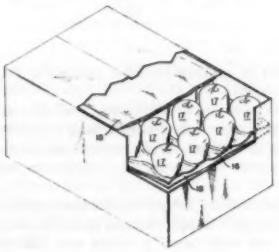
ATMOSPHERE CONTROL CUSHIONING PAD

David M. Clevenger, Yakima, Wash., assignor to Michelsen Packaging Company, Yakima, Wash.

Filed Oct. 11, 1983, Ser. No. 540,930

Int. Cl.³ B32B *1/04*

U.S. Cl. 428—74 **23 Claims**



1. A cushioning pad for use in storage or packaging of produce comprising;

a layer of cushioning material having voids throughout the body thereof;

a gas permeable envelope containing said cushioning material; and

a chemical composition dispersed in the voids in said cushioning material for interacting with the ambient atmosphere.

4,528,229

CAMOUFLAGE MATERIAL FOR USE AS PROTECTION AGAINST RADAR OBSERVATION

Willi Gottlieb, No. 15 Avannarliit, 3900 Nuuk, Greenland

Filed Mar. 5, 1984, Ser. No. 586,263

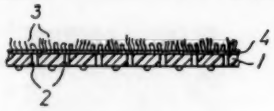
Claims priority, application Denmark, Mar. 14, 1983, 1183/83

Int. Cl.³ F41H *3/00*

U.S. Cl. 428—85 **9 Claims**

1. A camouflage material for use as multi-spectral camouflage including protection against radar observation, comprising a layered backing material with a pile of textile or synthetic fibres or loops preferably of unequal lengths and extending in different directions, said fibres or loops being fixed to the support backing material; filament or threadlike pieces, which

affect radar waves applied to the camouflage material's unshielded free upper surface with arbitrarily mutual directions



and positions and with random spatial orientations and distribution.

4,528,230

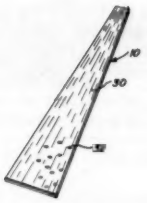
EMERGENCY REPAIR TAPE

Donald A. Larson, 8203 Maple Ridge Rd., Bethesda, Md. 20814

Filed Dec. 23, 1982, Ser. No. 452,443

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—137 **10 Claims**



1. An emergency repair tape for repairing worn metal parts, such as rotating shafts, surfaces subject to wear from lateral motion, and rusted or corroded sheet metal, said repair tape comprising:

metallic foil means for positioning over said worn metal parts;

wear resistance means for improving the durability and wear resistance of said metallic foil means, said wear resistance means being incorporated into a construction of said metallic foil means, said wear resistance means including impregnating said tape with a lubricant so as to improve lubricity between said tape and abutting surfaces; and

adhesive means operably secured to said metallic foil means for effecting an attachment of said metallic foil means to said worn metal parts.

4,528,231

SLIP AND WEAR RESISTANT FLOORING AND COMPOSITIONS AND A METHOD FOR PRODUCING SAME

Thore Lund, Hofors, Sweden, assignor to SKF Steel Engineering AB, Sweden

Filed May 5, 1983, Ser. No. 491,749

Claims priority, application Sweden, May 7, 1982, 8202865

Int. Cl.³ B44D *5/08;* **E04F** *11/16, 15/00*

U.S. Cl. 428—148 **6 Claims**

1. In a slip and wear resistant floor surface layer overlying a sub-floor in which the surface layer comprises a synthetic resin having metallic particles uniformly distributed therein to impart slip and wear resistance to said surface layer, the improvement which comprises:

said metallic particles being part of a mixture of the waste steel particles obtained in the conventional grinding of steel ingots prior to hot rolling to form steel plates;

said waste steel particles comprising about 60 to about 85% coarse steel particles having a particle size of from about 0.2 mm to about 1 mm, and about 15 to about 40% of fine oxidic particles having a particle size of about 0.2 mm, by weight of said particulate mixture;

said mixture of waste particles being uniformly distributed in a surface layer comprising about 15 to about 35% cured synthetic resin and about 60 to about 85% of said waste particles, by weight of said surface layer;

said proportions of coarse steel particles and fine oxidic particles being such that the fine oxidic particles aid in preventing settling of said coarse particles in the resin matrix prior to curing without the use of a separate thickening agent for the matrix resin; whereby a slip and wear resistant floor surface layer is obtained in which the particulate waste material is uniformly distributed throughout the floor surface layer including the surface thereof.

2. In a process for producing a slip and wear resistant floor surface layer overlying a sub-floor, in which the surface layer comprises a synthetic resin having metallic particles distributed therein to impart slip and wear resistance to said surface layer, the improvement which comprises:

as a new use for an old material, incorporating a particulate waste material obtained by grinding steel ingots prior to hot rolling the same in an uncured synthetic resin so as to be uniformly dispersed therein;

applying said uncured resin-particulate waste mixture to a sub-floor in a layer thick enough to provide a finished floor of sufficient thickness to provide a durable floor;

said uncured resin-particulate waste material mixture comprising about 15 to about 35% synthetic resin and about 60 to about 85% particulate waste material by weight of the mixture;

said particulate waste material comprising about 60 to about 85% coarse steel particles having a particle size of from about 0.2 mm to about 1 mm, and about 15 to about 40% of fine oxidic particles having a particle size of about 0.2 mm, by weight of the particulate mixture;

said proportions of coarse steel and fine oxidic particles providing a resin-particle mixture suitable for floor covering purposes and in which the fine oxidic particles aid in preventing settlement of the coarse steel particles without the use of a separate thickening agent for the matrix resin; and curing the resin matrix in situ to provide a resin-particle slip and wear resistant surface layer; in which said particulate waste material is uniformly distributed throughout the floor surface layer including the surface thereof.

4,528,232

WINDSCREEN ACCESSORY

Nicholas R. Cliffe, Marple, England, assignor to Fade-In Products Limited, Cheshire, England

Filed Apr. 8, 1983, Ser. No. 483,116

Claims priority, application United Kingdom, Apr. 14, 1982, 8210832

Int. Cl.³ B60J *3/00*

U.S. Cl. 428—195 **20 Claims**

1. An anti-glare accessory for application to an upper edge of a surface of a windscreen of an automobile, said accessory comprising:

a strip of clear plastic film shaped to conform to said upper edge of said surface of said windscreen;

opacifying means associated with said strip of plastic film, said opacifying means comprising a graduated matrix of dots providing said strip of plastic film with a gradually

increasing degree of transparency in a direction extending from an upper edge of said strip of plastic film to a lower edge of said strip of plastic film; and

means for adhering said strip of plastic film to a surface of the windscreen of an automobile.

4,528,233

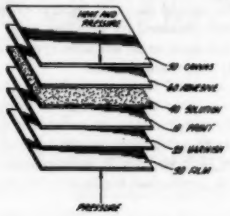
PHOTOGRAPHIC MOUNTING PROCESS AND COMPOSITION

David F. Free, 1236 Deerpark Dr., #65, Fullerton, Calif. 92631

Division of Ser. No. 287,205, Jul. 27, 1981, Pat. No. 4,410,386, which is a continuation-in-part of Ser. No. 259,151, Apr. 30, 1981, abandoned, which is a continuation of Ser. No. 63,861, Aug. 6, 1979, abandoned. This application Oct. 18, 1983, Ser. No. 543,074

Int. Cl.³ B32B *3/00, 7/14*

U.S. Cl. 428—205 **33 Claims**



6. A laminate, comprising: a thinned print having a front side and a back side, said thinned print having been a print before a backing was stripped from the print, the thinned print having been exposed to a chemical solution comprised of water, an optical brightener and a surfactant; a varnish coating applied to the front side of the thinned print; and a mounting material having a textured surface bonded to the back side of the thinned print.

4,528,234

TRANSPARENT LAMINATES

Keisuke Kaiho, and Hidetoshi Nagata, both of Kyobashi, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,977

Claims priority, application Japan, Jan. 8, 1982, 57-969; Oct. 4, 1982, 57-173295

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—216 **14 Claims**

1. A transparent laminate comprising a transparent plastic resin film or sheet substrate (A), a thin layer (B) of at least one metal selected from the group consisting of aluminium, tin, iron, zinc and magnesium, said layer being formed on said plastic resin film or sheet substrate (A) by vacuum deposition or sputtering of the metal thereon and having a thickness ranging from monomolecular to 100 angstrom, and a carboxyl group-containing polyolefin layer (C) formed on said metal layer (B) by lamination.

4,528,235

POLYMER FILMS CONTAINING PLATELET PARTICLES

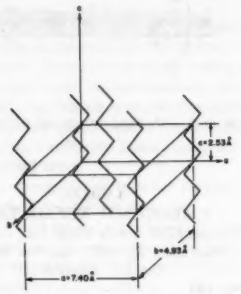
William Sacks, Gillette; John P. Sibilia, Livingston; Abraham M. Kotliar, Westfield, all of N.J.; Harold D. Oltmann, and Shu P. Chen, both of Baton Rouge, La., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 5, 1982, Ser. No. 405,225

Int. Cl.³ B32B *5/16, 27/08*

U.S. Cl. 428—220 **26 Claims**

1. A film having at least one layer comprising: high density polyethylene having a melt index of from 0.01 to 1.0 g/10 minutes at 190° C. as measured on ASTM Test No. D-1238 using a load of 2160 grams; and from 10 to 50 weight percent of a platelet filler wherein the filler has an average equivalent diameter of from 1 to 8 micrometers, a maximum diameter of



25 micrometers, and a thickness of less than 0.5 micrometers, the filler being homogeneously distributed through the film and substantially parallel to the plane of the film, the film being from 10 to 100 micrometers in thickness.

4,528,236

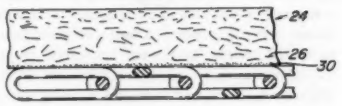
LAMINATED SOFT FACED-SPIRAL WOVEN PAPERMAKERS FABRIC

William A. Finn, Summerville, S.C., and Harry I. Searfass, Wayne, Pa., assignors to Asten Group, Inc., Devon, Pa.

Filed Aug. 10, 1984, Ser. No. 639,959

Int. Cl.³ D03D *13/00*

U.S. Cl. 428—222 **9 Claims**



1. An improved papermakers fabric of the type having synthetic monofilament yarns interconnected to define an under layer and a batt which defines an upper layer, said under layer and upper layer being retained in a single fabric by adhesive means, the improvement characterized by:

an under layer comprised entirely of a plurality of intermeshed synthetic monofilment spiral strips which are retained in that relationship by pintle means.

4,528,237

COLOR CHANGEABLE FABRIC CONTAINING MICROMAGNETS ADHERED TO A SUBSTRATE

Clarence R. Tate, Fairfield, Ill., assignor to Thalatta, Inc., Fairfield, Ill.

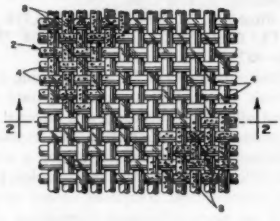
Division of Ser. No. 272,531, Jun. 11, 1981, Pat. No. 4,457,723. This application Apr. 30, 1984, Ser. No. 605,270

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—240 **12 Claims**

1. An article of manufacture comprising a substrate and a

fabric adhered to said substrate, said fabric comprising hollow transparent filaments bound together, said filaments containing



a transparent liquid having rotatable color-coded micromagnets dispersed therein.

4,528,238

PRODUCTION OF FIBRE-REINFORCED CEMENTITIOUS COMPOSITION

Neil M. Alford, Chester, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 30, 1983, Ser. No. 567,346

Claims priority, application United Kingdom, Jan. 19, 1983, 8301450

Int. Cl.³ B32B *13/02, 13/14*

U.S. Cl. 428—246 **33 Claims**

18. A shaped article of a mouldable fibre-containing cementitious composition wherein the cementitious composition is a homogeneous mixture of at least one hydraulic cement, water in a proportion of not more than 25% by weight of the hydraulic cement in the composition, and at least one water-soluble or water-dispersible polymeric material in a proportion of at least 1% by weight of the hydraulic cement in the composition, and in that at least one mat of a water-insoluble fibrous material is in contact with the shaped article.

28. A shaped article as claimed in claim **18** characterised in that the article contains more than two sheets of mouldable cementitious composition and in that one or more mats of fibrous material are sandwiched between each adjacent pair of sheets of mouldable cementitious composition.

29. A shaped article as claimed in claim **18** characterised in that the mat of fibrous material is a woven mat.

4,528,239

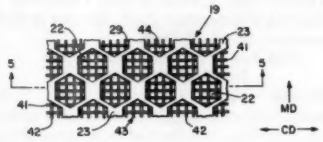
DEFLECTION MEMBER

Paul D. Trokhan, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 23, 1983, Ser. No. 525,585

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—247 **25 Claims**



1. A foraminous deflection member comprising a foraminous element and a framework, said framework comprising a macroscopically monoplanar, patterned, continuous network surface defining within said member a plurality of discrete, isolated, deflection conduits.

4,528,240

MAGNETIC RECORDING MEDIUM

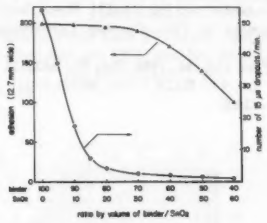
Takahito Miyoshi, Odawara; Masaaki Fujiyama, and Toshimitu Okutu, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 2, 1984, Ser. No. 576,273

Claims priority, application Japan, Feb. 4, 1983, 58-16285

Int. Cl.³ G11B *5/62*

U.S. Cl. 428—323 **17 Claims**



1. A magnetic recording medium including a substrate, a magnetic layer, and a subbing layer therebetween wherein said subbing layer has a thickness of 0.03 to 0.08 micron, and includes tin oxide type powders having a mean particle size of not higher than 0.08 micron and an organic binder in a ratio, by volume of the tin oxide type powder to the binder, of 1:99 to 70:30.

4,528,241

CHEMICALLY MODIFIED ASPHALTS AND GLASS FIBERS TREATED THEREWITH

William E. Uffner, Newark, and Robert N. White, Etna, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 407,390, Aug. 12, 1982,. This application Feb. 6, 1984, Ser. No. 577,394

Int. Cl.³ B32B *11/00;* **C08L** *95/00*

U.S. Cl. 428—378 **5 Claims**

1. In a glass fiber bundle comprised of a multitude of individual glass fiber filaments and having an asphaltic coating thereon, the improvement wherein said coating is a reaction product of asphalt, a vinyl aromatic monomer and a linear block copolymer of styrene and butadiene having polystyrene end blocks and a polybutadiene mid block, said composition impregnating said bundle by coating substantially the entire surface area of said individual filaments, and wherein said composition has an increased elastic recovery rate, increased viscosity stability, is less tacky, has a lower viscosity and improved glass fiber bundle impregnant qualities compared to a composition which is the reaction product of said asphalt, said vinyl aromatic monomer and a rubbery polymer which is a styrene-butadiene copolymer of the A-B type.

4,528,242

INK JET RECORDING TRANSPARENCY

Herman Burwasser, Boonton, N.J., assignor to Transcopy, Inc., New York, N.Y.

Filed Mar. 20, 1984, Ser. No. 591,602

Int. Cl.³ B41M *5/00*

U.S. Cl. 428—413 **10 Claims**

1. An ink jet recording transparency capable of forming very high density images when an aqueous-miscible ink is jetted thereon consisting essentially of

(a) a substantially transparent resinous support, and

(b) a substantially clear coating thereon consisting essentially of

(1) a carboxylated polymer or copolymer, or salts thereof, having a molecular weight of about 50,000 to 1 million, and

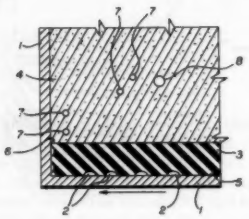
(2) a polyalkylene glycol having an average molecular weight of about 5,000 to about 25,000, and being present in an amount of about 5% to about by weight of said polymer.

4,528,243

METHOD FOR SURFACE TREATMENT OF POLYORGANOSILOXANE GEL-FILLED CONTAINERS TO PREVENT BUBBLE MIGRATION INTO SAID GEL

Gust J. Kookootsedes, and Herschel H. Reese, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 16, 1984, Ser. No. 661,534
Int. Cl.³ B32B *27/40;* **B05D** *3/02*
U.S. Cl. 428—425.5 **28 Claims**



15. A composite consisting essentially of (I) a substrate wherein at least one surface thereof is coated with (II) a layer of cured silicone rubber that is cohesively bonded to said substrate by means of an organohydrogensiloxane and (III) a cured polyorganosiloxane gel overlaying said silicone rubber and cohesively bonded thereto, where said layer of silicone rubber is at least three millimeters thick, said silicone rubber exhibits a durometer of at least 10 on the Shore A scale, and where said organohydrogensiloxane, silicone rubber and polyorganosiloxane gel are cured concurrently by means of a platinum catalyzed hydrosilation reaction.

27. A composite according to claim **15** where said substrate comprises an organic polymer.

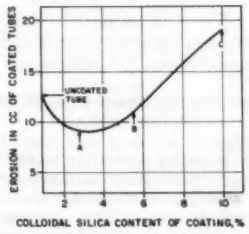
28. A composite according to claim **27** where said organic polymer is a polyurethane.

4,528,244

FUSED SILICA SHAPES

Howard M. Winkelbauer, West Mifflin, and Ke-Chin Wang, Pittsburgh, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 30, 1983, Ser. No. 537,921
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—446 **6 Claims**



1. Fused silica shapes having a coating of sialon on its surfaces.

4,528,245

PRETREATMENT OF PLASTIC MATERIALS FOR METAL PLATING

Jill M. Jobbins, Elbridge, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 27, 1984, Ser. No. 583,916
Int. Cl.³ B05D *1/18, 3/10;* **B32B** *15/04, 15/08*
U.S. Cl. 428—457 **29 Claims**

1. In an improved process for metal plating a natural or synthetic plastic material by conditioning said material to improve metal adhesion by exposing said material to an atmosphere comprising ozone, contacting said exposed material with a conditioning solvent, and depositing a metal coating upon said conditioned surface from an electroless plating bath, wherein said improvement comprises rinsing said contacted material with an aqueous solution comprising an effective amount of one or more surfactants after contacting said material with said solvent and before depositing said metal coating.

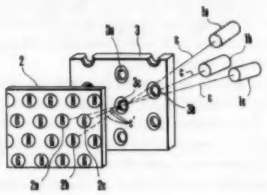
28. A natural or synthetic material which has been conditioned and metal plated in accordance with the process of claim **1**.

4,528,246

SHADOW MASK

Emiko Higashinakagawa, Kawasaki; Kanemitsu Sato, Yokohama; Michihiko Inaba, Kawasaki; Yasuhisa Ohtake, Fukaya; Masaharu Kantou, Taishicho, and Masayuki Itoh, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 26, 1983, Ser. No. 526,824
Claims priority, application Japan, Aug. 27, 1982, 57-147740; Feb. 8, 1983, 58-19085
Int. Cl.³ H01J *29/07;* **C21D** *9/46*
U.S. Cl. 428—596 **10 Claims**



1. A shadow mask for a color picture tube comprising a fluorescent face, said shadow mask comprising an alloy having (i) a face-centered cubic lattice structure and (ii) a f-parameter of the (100) texture on a surface of said alloy immediately adjacent to said fluorescent face of at least 0.35.

4,528,247

STRIP OF NICKEL-IRON BRAZING ALLOYS CONTAINING CARBON AND PROCESS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 500,113
Int. Cl.³ C22C *19/03*
U.S. Cl. 428—606 **3 Claims**

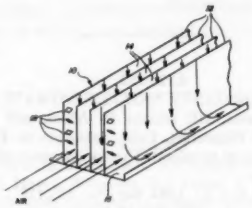
1. A metallic strip consisting essentially of a nickel based brazing alloy consisting essentially of from about 6% to about 40% by weight iron, from 0 to about 15% by weight of chromium, from about 1% to about 6% by weight of boron, from 0 to about 6% by weight silicon, from about 0.02% to about 1% by weight of carbon and from about 60% to about 92.9% by weight of nickel, said strip having a thickness of from about 0.5 to 5 mils.

4,528,248

ELECTROCHEMICAL CELL AND METHOD

Andrew D. Galbraith, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jul. 30, 1984, Ser. No. 635,660
Int. Cl.³ H01M *14/00*
U.S. Cl. 429—8 **14 Claims**



1. An electrochemical cell, comprising:
a reactive alkali metal anode;
a cathode spaced from said anode to define an electrochemical reaction zone;
an electrolyte comprising an aqueous solution of the hydroxide of said reactive metal;
means contacting said electrolyte with carbon dioxide to form a carbonate reaction product of said metal hydroxide and said carbon dioxide;
means for separating said reaction product from said electrolyte; and,
means for recirculating said electrolyte from said contacting means to said reaction zone.

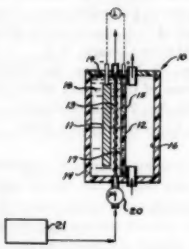
9. A method of generating power from an electrochemical cell comprising the steps of:
(a) supplying an electrolyte to an electrochemical reaction zone defined between a cathode and a reactive alkali metal anode of said cell, said electrolyte comprising an aqueous solution of the hydroxide of said reactive metal;
(b) conducting said electrolyte to a gas/liquid contacting means and reacting with carbon dioxide to form a carbonate reaction product of said metal hydroxide and said carbon dioxide;
(c) separating said reaction product from said electrolyte; and,
(d) recirculating said electrolyte to said reaction zone.

4,528,249

ELECTROCHEMICAL CELL AND METHOD

Andrew D. Galbraith, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 497,252, May 19, 1983, abandoned. This application Oct. 24, 1984, Ser. No. 664,106
Int. Cl.³ H01M *12/06*
U.S. Cl. 429—15 **25 Claims**



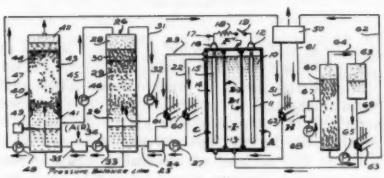
1. The method of providing electrical energy from an electrochemical cell having a lithium-containing anode and an oxygen-consuming cathode, comprising the steps of:
contacting a first surface portion of the cathode with an oxygen-containing gas; and
contacting a second surface portion of the cathode with an electrolyte containing soluble oxygen for providing oxidizer to the cathode.

4,528,250

FUEL CELL CATHOLYTE REGENERATING APPARATUS

Ralph C. Struthers, 39503 Calle El Fuente, Saugus, Calif. 91350

Filed Sep. 19, 1983, Ser. No. 533,363
Int. Cl.³ H01M *8/06*
U.S. Cl. 429—19 **11 Claims**



1. A catholyte regenerating apparatus in combination with a fuel cell having a cathode section containing a catholyte solution and wherein fuel cell reaction reduces the catholyte to gas and water, said apparatus includes liquid conducting means conducting partially reduced water diluted catholyte from the fuel cell, gas conducting means conducting the gas from the fuel cell, mixing means connected with the liquid and gas conducting means and receiving the diluted catholyte and gas conducted thereby, an absorption tower containing a volume of gas absorbing liquid solvent, delivery means conducting the mixed together gas and diluted catholyte from the mixing means into the absorption column wherein the gas is absorbed by the solvent and the gas ladened solvent and diluted catholyte are commingled, air supply means, a liquid transfer means conducting gas ladened commingled solvent and electrolyte from the absorption column to the air supply means wherein air is added and commingled therewith and a stoichiometric volume of oxygen is absorbed thereby, a catalyst column containing a packing of catalyst, a second liquid transfer means conducting the gas ladened commingled solvent and diluted catholyte into the catalyst column wherein the oxygen and gas react to reconstitute the catholyte from which the gas was generated and wherein the reconstituted diluted catholyte is separated from the solvent, recirculated means conducting the solvent from the catalyst column into the absorption column, a holding tank, a line conducting the diluted catholyte with reconstituted catholyte added from the catalyst column to the holding tank and catholyte return means conducting catholyte from the holding tank to the cathode section of the fuel cell.

4,528,251

DIFFERENTIAL-PRESSURE CONTROL DEVICE FOR A FUEL CELL

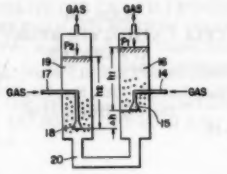
Masanori Yamaguchi; Yasuyuki Tsutsumi; Shunsuke Nogita; Kazunari Shimada, all of Hitachi, and Saburo Maruko, Yamato, all of Japan, assignors to Hitachi, Ltd. and Nippon Chemical Plant Consultant Co., Ltd., both of Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,245
Claims priority, application Japan, Jul. 18, 1983, 58-129415
Int. Cl.³ H01M *8/04*
U.S. Cl. 429—25 **4 Claims**

1. A differential-pressure control device for fuel cell comprising:
three liquid tubs allowed to communicate with each other at

their respective bottom portions through a sealing liquid having free surfaces;

gas pipe means which connect said liquid tubs to gas outlets of the fuel cell respectively to introduce the gas flows from an anode, a cathode and a cell container of the fuel cell into said sealing liquid of said liquid tubs, each of said gas pipe means being formed with a gas blow out section



opened in said sealing liquid at the end portion thereof, said gas blow out sections having relative heights set at the values corresponding to predetermined differential pressures among said electrodes and said cell container; and

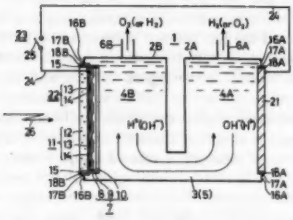
conduit means for guiding the gas to the outside of the device from the gas chambers defined by said liquid tubs and said free surfaces of said sealing liquid respectively and located at the tops of said liquid tubs respectively.

4,528,252

LIGHT ENERGY CONVERSION SYSTEM

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Mar. 28, 1983, Ser. No. 479,558
Claims priority, application Japan, Mar. 29, 1982, 57-50534
Int. Cl.[3] H01M *6/36*; C25B *1/02*
U.S. Cl. 429—111 **17 Claims**



1. A light energy conversion system comprising:

a redox reaction chamber provided with first and second cells intercommunicating through a bridge and respectively containing first and second aqueous solutions of the same kind, and first and second gas outlet means extending outwardly of the first and second cells, respectively;

a semiconductor photoelectric conversion structure having a first non-single-crystalline semiconductor layer of a P or N first conductivity type, an I type second non-single-crystalline semiconductor layer formed on the first semiconductor layer, and a heavily doped, third non-single-crystalline semiconductor layer of a second conductivity type opposite that of the first conductivity type of the first non-single-crystalline semiconductor layer formed on the second non-single-crystalline semiconductor layer;

a first electrode in contact with the first aqueous solution contained in the first cell of the redox reaction chamber;

a second electrode connected to the first non-single-crystalline semiconductor layer of the photoelectric conversion semiconductor structure and paired with the first electrode; and

means for electrically interconnecting the first and second electrodes; and

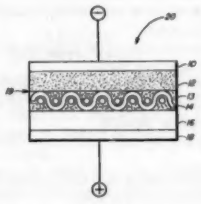
wherein the semiconductor photoelectric conversion structure is provided in the second cell (a) so that it forms a part of the cell wall, (b) so that light is incident on the semiconductor photoelectric conversion structure directly without passing through the second aqueous solution, and (c) so that only the portion of the semiconductor photoelectric conversion structure on the side of the third non-single-crystalline semiconductor is held in contact with the second aqueous solution.

4,528,253

HIGH PERFORMANCE MOLTEN NITRATE CELL

George E. McManis, III; Melvin H. Miles, and Aaron N. Fletcher, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 21, 1984, Ser. No. 653,115
Int. Cl.[3] H01M *6/36*
U.S. Cl. 429—112 **4 Claims**



1. A thermally activated electrochemical cell including:

an anode backing composed of a metal selected from the group consisting of nickel, stainless steel, copper and iron;

an anode composed of lithium and a transition metal selected from the group consisting of iron, nickel, cobalt, and copper, in contact with said anode backing;

an electrolyte composed of lithium nitrate and at least one nitrate salt selected from the group consisting of potassium nitrate and sodium nitrate, in contact with said anode;

a silver nitrate cathode enhancer contacting said electrolyte; and

a cathode current collector composed of a metal selected from the group consisting of platinum, nickel, silver, iron, copper, and enhancer.

4,528,254

CONJUGATED POLYMER BATTERY CONTAINING ORGANOSULFUR SOLVENT

James F. Wolf, Dover; Suzanne M. Savner, Lake Hiawatha; MacRae Maxfield, North Plainfield, and Lawrence W. Shacklette, Maplewood, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 30, 1983, Ser. No. 556,717
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[3] H01M *6/14, 4/60*
U.S. Cl. 429—197 **19 Claims**

1. In a battery comprising an anode, a cathode and an electrolyte, wherein at least one of the anode and cathode comprises a conjugated backbone polymer wherein the electrolyte comprises an organic solvent having dissolved therein a salt, lith at least a portion of said salt inserting into said conjugated backbone polymer during the charging or discharging of said battery, the improvement wherein the solvent comprises at least one sultone of the formula:

wherein: R is alkylene having from 2 to about 5 carbon atoms either unsubstituted or substituted with one or more alkoxy or alkyl groups having from 1 to about 4 carbon atoms.

4,528,255

GRIDS FOR ELECTRIC STORAGE BATTERIES

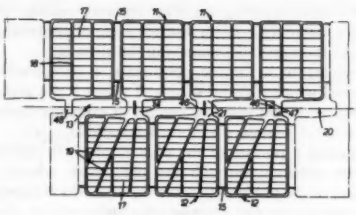
Michael H. Hayes, Wilmslow, and Ernest J. Pearson, Swinton, both of England, assignors to Chloride Group Public Limited Company, London, England

Filed Oct. 31, 1983, Ser. No. 547,099

Claims priority, application United Kingdom, Oct. 29, 1982, 8230957; Jul. 14, 1983, 8319055

Int. Cl.³ H01M *4/73*

U.S. Cl. 429—233 **24 Claims**



1. A grid array for use in providing plates for multicell electric storage battery by superimposing a plurality of finite lengths of the grid array to form a laminated structure, the grid array comprising a plurality of spaced grids arranged in a common plane, in two interconnected side-by-side lines, so that each grid in each said length of the array can be formed into one plate for each cell of the battery without altering the spacial relationship between them, with each grid in each line in the array being connected to at least one adjacent grid in the same line by at least one temporary link and with at least one grid in each line in each length of the grid array being connected to an adjacent grid in the other line by an integral permanent bridge piece.

4,528,256

ELECTROPHOTOGRAPHIC RECORDING MATERIAL WITH CONDENSATION PRODUCT

Erwin Lind, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 599,802

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313798

Int. Cl.³ G03G *5/09, 5/06*

U.S. Cl. 430—83 **18 Claims**

1. An electrophotographic recording material, comprising:

(a) support layer; and

(b) a photoconductive layer applied thereto, wherein the photoconductive layer comprises: an organic photoconductor; a binder; a sensitizer; and a condensation product of a benzophenone-2-carboxylic acid and a dialkyl aniline.

4,528,257

TONER POWDER AND METHOD OF FORMING FIXED IMAGES

Arie Polderman, Velden; Johannes W. H. Handels, Roermond, and Johannes H. Kuit, Hengelo, all of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Jun. 9, 1983, Ser. No. 502,584

Claims priority, application Netherlands, Jun. 17, 1982, 8202452

Int. Cl.³ G03G *9/08, 9/14*

U.S. Cl. 430—109 **10 Claims**

1. A toner powder consisting of heat-fusible particles composed of thermoplastic resin and coloring material with or without other additives, said resin comprising predominantly a thermoplastic block copolymer containing in its molecule at least 65% by weight of crystalline polymeric blocks and at least 5% by weight of amorphous polymeric blocks, said crystalline blocks and said amorphous blocks mutually being immiscible with one another and respectively forming in said block copolymer a continuous crystalline polymeric phase and a disperse amorphous polymeric phase, said crystalline blocks having a melting point between 45° and 90° C. and said amorphous blocks having a Tg at least 10° C. above the melting point of the crystalline blocks, said particles exhibiting a crystallization temperature reduction of between 20° and 40° C.

4,528,258

PROCESS FOR FORMING IMAGE

Hiroshi Kitaguchi, and Hideki Naito, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

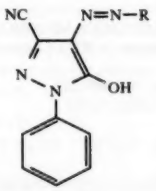
Filed Mar. 12, 1984, Ser. No. 588,259

Claims priority, application Japan, Mar. 11, 1983, 40247/83

Int. Cl.³ G03C *1/40, 5/54*

U.S. Cl. 430—203 **11 Claims**

1. A process for forming an image which comprises heating a light-sensitive material comprising a support having thereon at least a light-sensitive silver halide, a binder and a dye-releasing redox compound which is reductive to the light-sensitive silver halide and which is capable of releasing a hydrophilic dye upon reaction with the light-sensitive silver halide on heating, after imagewise exposure or simultaneously with imagewise exposure, in a substantially water-free condition, said dye-releasing redox compound being represented by the formula (I)



wherein R represents a phenyl group having a hydroxy-substituted alkoxy group or an alkoxy-substituted alkoxy group at the 2-position thereof with respect to the diazo group and a group of the formula $—SO_2NH—Y$ at the 5-position thereof with respect to the diazo group where Y represents a group capable of being oxidized by silver halide to release a dye moiety including the $—SO_2NH$ moiety.

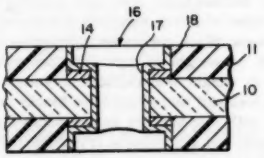
10. The process of claim 1, wherein said light-sensitive material comprises a light-sensitive layer (I) containing at least a silver halide, an organic silver salt oxidizing agent, a dye-releasing redox compound of the formula (I), and a binder; and a dye-fixing layer (II) capable of receiving the hydrophilic diffusible dye formed in light-sensitive layer (I).

4,528,259

PRINTED WIRING BOARDS WITH SOLDER MASK OVER BARE COPPER WIRES HAVING LARGE AREA THICKENED CIRCUIT PAD CONNECTIONS

Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Filed Nov. 10, 1983, Ser. No. 550,379
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.³ G03C *5/00*; G03F *7/26*
U.S. Cl. 430—312 **6 Claims**



2. The method of improving reliability of connector sites at land areas on printed wiring boards having conductor layer traces with circuit thereon adhered to an insulation board substrate, comprising the steps of:

placing an insulation layer of a thickness of at least 0.002 in. (0.005 cm) selectively over part of the traces and leaving exposed land areas of said conductor traces to be metallized and adjacent insulation surface area on the insulation layer adjacent the land areas, and

metallizing the exposed land areas together with said adjacent insulation surface area wherein the insulation layer is metallized on sidewalls surrounding the exposed land area, thereby increasing the metallized surface area beyond the bounds of the exposed land areas wherein the step of placing the insulation layer selectively over the conductor traces comprises the steps of coating the entire surface of the printed wiring board with a layer of liquid photopolymer, coating a flat plate phototransparency with a layer of liquid photopolymer, registering the photo transparency with the printed wiring board with the two liquid layers in air free contact, exposing the photopolymer to radiation through the photo transparency to harden those areas to be covered by the insulation layer, and washing out the unhardened photopolymer to establish said exposed land areas.

4,528,260

METHOD OF FABRICATING LENTICULAR ARRAYS

James Kane, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 27, 1983, Ser. No. 489,221
Int. Cl.³ G03C *5/00*; G03B *21/60*
U.S. Cl. 430—321 **8 Claims**

1. A process for manufacturing lenticular arrays which comprises

(a) coating a 100 silicon wafer with a first protective layer of silicon oxide and a layer of photoresist over the oxide layer,

(b) exposing the photoresist through a photomask having a uniform grating of the desired periodicity of the lens array,

(c) developing the photoresist and etching through the oxide layer to form a regular series of openings to the silicon substrate,

(d) anisotropically etching the silicon substrate to form a series of V-grooves with very sharp bottoms in the openings wherein the walls of the grooves intersect along the 111 planes,

(e) removing the photoresist and oxide layers,

(f) replicating the V-grooved silicon substrate in nickel to form a series of inverted V-peaks,

(g) spin-coating a hardenable liquid resin onto the nickel replica to form a series of lenses, and

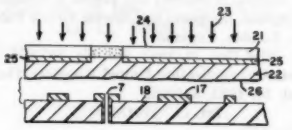
(h) hardening the resin thereby forming a lens array having a minimum of area between the lenses.

4,528,261

PRELAMINATION, IMAGEWISE EXPOSURE OF PHOTOHARDENABLE LAYER IN PROCESS FOR SENSITIZING, REGISTERING AND EXPOSING CIRCUIT BOARDS

William P. Hauser, Cranbury, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1983, Ser. No. 479,494
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—322 **36 Claims**



1. A process of applying to a substrate and exposing a photohardenable material to obtain discrete areas of photohardened material on the substrate comprising the steps of:

(a) applying to a flexible photomask a photohardenable material which is deformable and which is not present as a solid with said material applied in excess compared to the amount necessary to form a layer in step (c);

(b) exposing a portion of the photohardenable material to actinic radiation through the photomask whereby the surface of the photohardenable material which faces away from the photomask remains deformable;

(c) applying exposed and unexposed material with the photomask to a substrate to form a layer whereby the surface of photohardenable material which remains deformable faces the substrate by applying pressure to the flexible photomask and advancing the pressure to remove excess photohardenable material between the photomask and substrate to form a registered preimaged laminate; and

(d) reexposing the layer containing photohardenable material to actinic radiation through the photomask whereby bonded discrete areas of photohardened material are obtained on the substrate.

10. The process of claim 1 wherein after step (d), the photomask is removed from the surface of the exposed photohardenable material and developer is applied to the surface of the photohardened material whereby unexposed unhardened discrete areas are removed.

4,528,262

PROCESS FOR FORMING PHOTORESIST IMAGES

Yoshio Nakano, Osaka, and Masao Tonda, Sakai, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 12, 1983, Ser. No. 484,269
Claims priority, application Japan, Apr. 13, 1982, 57-62200
Int. Cl.³ G03C *1/495, 5/00*
U.S. Cl. 430—325 **4 Claims**

1. A process for forming photoresist images which comprises sticking a laminate of (A) a heat-treated film of a polyvinyl alcohol which is not soluble in water, but is swellable with water and has an average degree of polymerization of 500 to 3,000 and a degree of hydrolysis of not less than 94% by mole and (B) a photosensitive layer, to a substrate so that the photosensitive layer (B) comes in contact with the substrate, exposing the photosensitive layer (B) to light through the film (A), washing away the film (A) with water as small film fragments,

and then developing the layer (B) with an aqueous alkali solution or an organic solution.

4,528,263

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroshi Sugita; Yasuo Tsuda; Kenji Ito, and Satoru Shimba, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 468,395, Feb. 22, 1983, Pat. No. 4,434,225. This application Feb. 27, 1984, Ser. No. 583,948

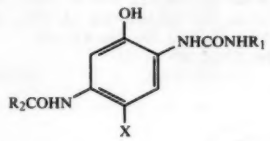
Claims priority, application Japan, Feb. 24, 1982, 57-29556; Feb. 26, 1982, 57-30849; Feb. 27, 1982, 57-31888

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—544 **2 Claims**

1. A light-sensitive silver halide color photographic material having at least one light-sensitive silver halide emulsion layer on a support, characterized in that said light-sensitive silver halide emulsion layer contains a cyan coupler represented by formula (I) shown below, and wherein at least one of said light-sensitive silver halide emulsion layer and a layer contiguous to said light-sensitive silver halide emulsion layer contains a timing DIR compound represented by the formula (II):

Formula (I)



wherein X represents a hydrogen atom or a group which is capable of being eliminated by a coupling reaction with an oxidized product of an aromatic primary amine color developing agent; R_1 is an aryl group; or a heterocyclic group; and R_2 is a ballast group necessary for imparting diffusion resistance to a cyan coupler represented by formula (I) and a cyan dye to be formed from said cyan coupler,

Formula (II)

wherein Cp represents a coupling component which is reactive with an oxidized product of an aromatic primary amine color developing agent, TIME represents a timing group which releases Z after the coupling reaction of Cp and Z represents a development inhibitor; and TIME is a group represented by the following formulae (IV), (V) or (VI):

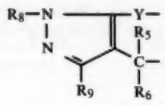
Formula (IV)

wherein B represents a group of atoms necessary for completion of a benzene ring or a naphthalene ring; Y represents —O—, —S—, or

which is bonded to the active site of Cp; R_5, R_6 and R_7 each represent a hydrogen atom, an alkyl group or an aryl group; and the group

is substituted at an ortho position or a para position relative to Y and bonded to a hetero atom included in Z;

Formula (V)



wherein Y, R_5 and R_6 have the same meanings as defined in formula (IV); R_8 is selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group, an acyl group, a sulfone group, an alkoxycarbonyl group and a heterocyclic ring residue; and R_9 is selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group, a heterocyclic ring residue, an alkoxy group, an amino group, an acid amide group, a sulfonamide group, a carboxylic group, an alkoxycarbonyl group, a carbamoyl group and a cyano group, said timing group being bonded through Y to the active site of Cp through

group to a hetero atom in Z; or

Formula (VI)

wherein Nu is a nucleophilic group having an oxygen, sulfur or nitrogen atom enriched in electrons and bonded to the coupling position of Cp; E is an electrophilic group having a carbonyl group, a thiocarbonyl group, a phosphinyl group or a thiophosphinyl group and bonded to a hetero atom in Z; and A is a steric correlation between Nu and E, and wherein A is a bonding group which is subject to an intramolecular nucleophilic reaction accompanied with the formation of a three-membered ring to a seven-membered ring after Nu has been released from Cp and can release Z through said nucleophilic reaction.

4,528,264

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Shoji Ishiguro; Hiroyuki Mifune; Yoshiharu Fuseya, and Tetsuro Kojima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1983, Ser. No. 552,224

Claims priority, application Japan, Nov. 16, 1982, 57-200626

Int. Cl.³ G03C *1/34*

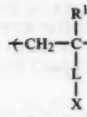
U.S. Cl. 430—609 **15 Claims**

1. A silver halide photographic light-sensitive material, comprising:

a support base having thereon:

a silver halide emulsion layer; and

a high molecular compound having a repeating unit being represented by the formula (I)



(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group, L represents a divalent bonding group, and X represents a monovalent group of benzotriazoles, wherein the high molecular compound in present in an anti-fogging or stabilizing amount

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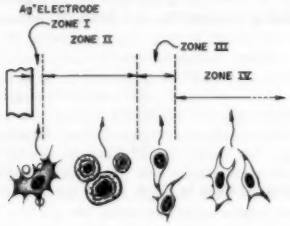
4,528,265

PROCESSES AND PRODUCTS INVOLVING CELL MODIFICATION

Robert O. Becker, Erie Canal Rd., Star Rte., Lowville, N.Y. 13367

Filed May 11, 1982, Ser. No. 377,038
Int. Cl.³ C12N *15/00, 1/36, 13/00, 5/00*
U.S. Cl. 435—172.1 **24 Claims**



1. A cell modification process which comprises the steps of:
(a) providing an element of metal at a culture medium having cells of a mammal therein including transformable cells chosen from the group consisting of fibroblast cells and malignant cells;
(b) causing the element to introduce ions of the metal to the medium, the ions being substantially free of anions;
(c) contacting the cells with the ions;
(d) maintaining said contact for a sufficient period of time and with a sufficient amount of the ions to change the transformable cells to unspecialized cells characterized by their relatively multi-potent state; said period of time being greater than the time normally necessary to inhibit or render bacteriostatic bacteria in a wound with respect to fibroblast cells, and being less than the time normally necessary to kill Erlich's ascites fluid tumor cells with respect to free-floating malignant cells;
(e) permitting or inducing a desired number of unspecialized cells to redifferentiate into cells of the culture medium other than fibroblast cells or malignant cells.

4,528,266

METHOD OF INSERTING UNIQUE DNA SEQUENCES INTO DNA VECTORS

George Pieczenik, 61 W. 62nd St., No. 11G, New York, N.Y. 10023

Division of Ser. No. 80,668, Oct. 1, 1979, Pat. No. 4,359,535. This application Sep. 30, 1982, Ser. No. 428,538
Int. Cl.³ C12Q *1/68;* **C12N** *15/00;* **C12P** *19/34*
U.S. Cl. 435—6 **5 Claims**

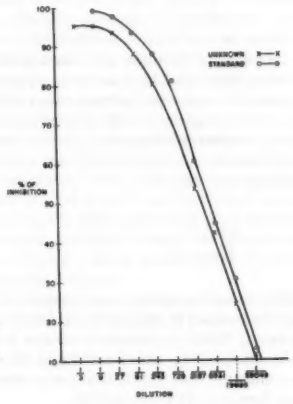
1. A method of inserting a unique oligonucleotide sequence into a non-essential region of an autonomously replicating DNA element, comprising,
isolating double stranded circular molecules of the DNA, each having the same nucleotide sequence,
cleaving the circular DNA at random with respect to nucleotide sequence, producing a population of linear, double stranded DNA molecules comprising circular permutations of the same nucleotide sequence,
joining a unique oligonucleotide sequence to the ends of the linear DNA molecules, said unique oligonucleotide sequence not otherwise existing in said DNA element, then
rejoining the ends to form circular double stranded DNA molecules having the oligonucleotide of unique sequence inserted at random with respect to the nucleotide sequence of each circular DNA molecule,
transferring the circular DNA having said unique insert sequence to a host organism under conditions permitting replication of the DNA, and
selecting for progeny of the circular DNA having a unique insert sequence, said progeny bearing said insert in a non-essential region of the DNA.

4,528,267

FLUOROMETIRC ENZYME INHIBITION IMMUNOASSAY FOR MEASURING POTENCY OF ALLERGEN EXTRACTS

Emanuel Calenoff, Burlingame; Yuh-Geng Tsay, San Jose; Ruth M. Jones, Los Altos, and Scott, John R., Mountain View, all of Calif., assignors to Axionics, Inc., Calif.

Continuation-in-part of Ser. No. 444,622, Nov. 26, 1982, , and a continuation-in-part of Ser. No. 434,061, Oct. 13, 1982,. This application Mar. 17, 1983, Ser. No. 476,440
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 **23 Claims**



1. A method for measuring the potency of allergen extracts comprising the sequential steps of
(a) contacting an insoluble support having reagent allergen adhered thereto with an aqueous solution containing a predetermined amount of allergen extract, and an amount of IgE specific to allergenic components present in the reagent allergen and presumed present in the allergen extract which is insufficient to bind with all of the allergenic components present, for a sufficient time to permit conjugation of IgE with allergenic components, and removing the solution from the support;
(b) contacting the insoluble support with an aqueous solution of anti-IgE antibody labeled with a fluorogenic enzyme for sufficient time to permit conjugation of anti-IgE antibody with IgE which has conjugated with reagent allergen on the insoluble support, and removing the solution from the support;

(c) contacting the insoluble support with an aqueous solution of a substrate which undergoes chemical reaction to yield a fluorescent product when in the presence of the fluorogenic enzyme, for sufficient time to yield a fluorescent product; and

(d) measuring the level of fluorescence in the solution.

4,528,268

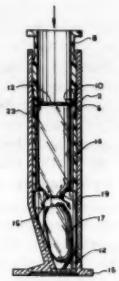
APPARATUS AND METHOD FOR TESTING THE SUFFICIENCY OF STERILIZATION

Harold W. Andersen, and Charles H. Harrison, both of Oyster Bay, N.Y., assignors to H. W. Andersen Products Inc., Oyster Bay, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,129

Int. Cl.³ C12Q *1/22;* C12M *1/24;* B65D *25/08*

U.S. Cl. 435—31 **21 Claims**



1. Apparatus for testing the sufficiency of sterilization comprising a test tube having an open end and a closed distal end, said test tube being adapted to receive a bacterial spore element, a sealed ampule containing a sterile liquid culture medium, said ampule being disposed in said test tube, engaging-breaking means in said test tube, and a hollow open-ended plunger fitted slidingly into the open end of said test tube into a position where said plunger is retained in said test tube and said ampule is disposed in said test tube in an unbroken state, said plunger having sealing means operable to seal off communication between the outside of said plunger and the inside of said test tube, a hydrophobic filter element sealing the distal fenestration of said plunger and allowing passage of air in and out of said test tube, said plunger being constructed and disposed such that upon increased insertion of the plunger into said test tube, said plunger engages said ampule to slide the latter into engagement with said engaging-breaking means in said test tube to thereby fracture or break the ampule so that its contents are released into said test tube to contact said spore element, said filter allowing oxygen to pass into said test tube while preventing bacteria from entering into said test tube, said filter also retaining the liquid in said test tube.

4,528,269

METHOD FOR PRODUCING SINGLE AND/OR MIXED STRAIN CONCENTRATES OF BACTERIA

William E. Sandine, Corvallis, Oreg., and Alan R. Huggins, Madison, Wis., assignors to The State of Oregon by and through the Oregon State Board of Higher Education on behalf of Oregon State University, Corvallis, Oreg.

Continuation of Ser. No. 139,821, Apr. 14, 1980, abandoned. This application Nov. 29, 1982, Ser. No. 444,948

Int. Cl.³ C12Q *1/04, 1/70;* C12N *1/20;* C12R *1/225, 1/23, 1/245, 1/46*

U.S. Cl. 435—34 **21 Claims**

1. A method for the differentiation of heterogeneous populations of fast acid producing strains of a species of bacteria from slow acid producing strains of the same bacteria which comprises:

(a) providing a solid bacterial growth medium containing milk protein, a milk protein derivative or a milk protein substitute and containing a pH sensitive indicator which changes color upon contact with acid in the pH range between about 4 and 7; and

(b) growing the heterogeneous populations of a strain or strains of acid producing bacteria substantially anaerobically on the medium to produce single strain acid producing bacterial colonies, wherein the colonies are of varying sizes and have a contrasting color from the growth medium around and within the colonies because of the reaction of the acid in the colonies with the indicator.

4,528,270

ELECTROCHEMICAL METHOD FOR DETECTION AND CLASSIFICATION OF MICROBIAL CELL

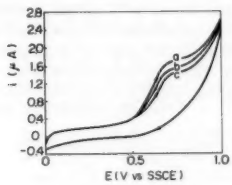
Tadashi Matsunaga, Ichikawa, Japan, assignor to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 546,101

Claims priority, application Japan, Nov. 2, 1982, 57-191802; Mar. 30, 1983, 58-52772; Mar. 30, 1983, 58-52773

Int. Cl.³ C12Q *1/04, 1/06*

U.S. Cl. 435—39 **6 Claims**



1. An electrochemical method for detecting and classifying living microbial cells comprising the steps of:

bringing the living microbial cells into contact with a working electrode;

applying a sweep potential between the working electrode as an anode and a counter electrode in the presence of 4,4'bipyridine as a current increasing agent; and

then measuring the generated anodic current between the electrodes to detect an anodic peak current that identifies the presence of living microbial cells.

4. The method of claim 1, wherein the cell numbers are determined by measuring the value of the peak current of the generated current.

4,528,271

PROCESS FOR THE INTENSIFICATION OF MICROBIOLOGICAL CONVERSIONS OF STEROIDS USING CYCLODEXTRIN ADDITIVES

Éva Udvardy Nagy née Cserey Pechány; István Bartho; Gábor Hantos; Mária Trinn; Zsuzsa Vida; József Szejtli; Agnes Stadler née Szöke; Ilona Habon, and Márta Balázs née Czurda, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt. and Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt., both of Budapest, Hungary

Filed Sep. 24, 1982, Ser. No. 423,084

Claims priority, application Hungary, Sep. 28, 1981, 2785

Int. Cl.³ C12P *33/16, 33/00, 33/20, 33/12, 33/18, 33/14, 33/06, 33/08, 33/10, 33/02, 33/04*

U.S. Cl. 435—55 **14 Claims**

1. A process for the intensification of a microbiological conversion of a steroid product which comprises the step of microbiologically converting the steroid substrate wherein the steroid is selected from the group consisting of an estrane, androstane, pregnane, cholestane, stigmastane and cardenolide, in the presence of an alpha-, beta- or gamma-cyclodextrin

or a mixture thereof by using 0.2 to 3 moles of the cyclodextrin per mole of the steroid substrate.

4,528,272

FERMENTATION OF BILE

Robert J. Park, Birkdale, and Raymond A. Leppik, Toowong, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

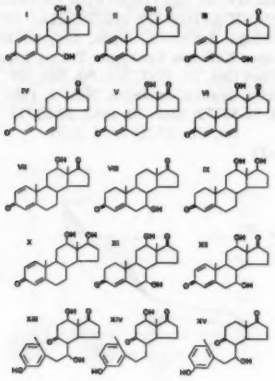
PCT No. PCT/AU81/00017, § 371 Date Oct. 22, 1981, § 102(e) Date Oct. 22, 1981, PCT Pub. No. WO81/02427, PCT Pub. Date Sep. 3, 1981

Continuation of Ser. No. 314,837, Oct. 22, 1981, abandoned. This PCT application Feb. 13, 1981, Ser. No. 597,813

Int. Cl.³ C12P *33/16;* C12R *1/38, 1/365*

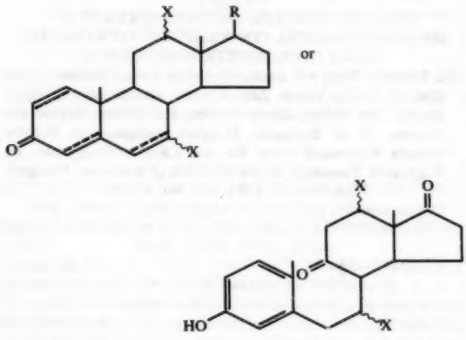
U.S. Cl. 435—55 **13 Claims**

TABLE I.



1. A process for the fermentation of bile which includes the steps of:

(1) cultivating one or more aerobic microorganisms selected from the group consisting of Rhodococcus, Pseudomonas, and Nocardia which has or have the ability to selectively degrade bile acids or bile acid conjugates contained in bile in a cultivation medium containing unfractionated bile as the sole cultivation medium under aerobic conditions while selectively varying the rate of aeration of the cultivation medium within the range of about 40 ml per minute per 10 liters to 1.5 liters per minute per 10 liters, to prepare a compound of the formula:



where ~ is a bond which is alpha or beta to the ring, X is hydrogen, hydroxyl or oxo, ═══ may be either a double or single bond, and R is oxo, hydroxy or a propionic acid residue attached at the 2-position, and

(2) isolating the compound so produced.

4,528,273

MICROORGANISM STRAINS FOR THE FERMENTATIVE PREPARATION OF L-SERINE

Gerald G. Lovinger, Gaithersburg, and Susan A. Whitehead, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Nov. 22, 1983, Ser. No. 554,452

Int. Cl.³ C12P *13/06;* C12R *1/15*

U.S. Cl. 435—116 **17 Claims**

1. A method for improving a strain of *Corynebacterium glycinophilum* capable of converting glycine to L-serine which comprises introducing mutations into the strain which cause the microorganisms to exhibit as characteristics: (1) serine dehydratase negativity and (2) resistance to at least one of the amino acid analogs (a) serine hydroxamate, (b) glycine hydroxamate or (c) methionine hydroxamate.

10. A process for preparing L-serine by fermentation which comprises culturing under aerobic conditions an improved strain of *Corynebacterium glycinophilum,* a microorganism capable of converting glycine to L-serine, said improved strain characterized by (1) serine dehydratase negativity and (2) resistance to at least one of the amino acid analogs serine hydroxamate, glycine hydroxamate or methionine hydroxamate.

14. An improved strain of *Corynebacterium glycinophilum,* an L-serine producing microorganism, said strain being characterized by (1) serine dehydratase negativity and (2) resistance to at least one of the amino acid analogs serine hydroxamate, glycine hydroxamate or methionine hydroxamate.

4,528,274

MULTI-PURPOSE BLOOD DILUENT AND LYSING AGENT FOR DIFFERENTIAL DETERMINATION OF LYMPHOID-MYELOID POPULATION OF LEUKOCYTES

James H. Carter, Ft. Lauderdale; Stephen L. Ledis, Hialeah; Harold R. Crews; Ted Sena, both of Miami, and Fred L. Larsen, Miami Lakes, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 395,530, Jul. 6, 1982, , which is a continuation of Ser. No. 159,782, Jun. 16, 1980, Pat. No. 4,346,018. This application Mar. 25, 1983, Ser. No. 478,960

Int. Cl.³ G01N *33/48;* C09K *3/00*

U.S. Cl. 436—10 **24 Claims**

1. A stromatolysing reagent for use in the determination of at least two leukocyte populations in blood, two such populations being lymphoid and myeloid, the blood being processed through a blood cell analyzer using the Coulter Principle of operation, which employs a leukocyte sensing zone, the blood having been first diluted with an electrically conductive isotonically balanced diluent, wherein said stromatolysing reagent comprises an aqueous solution of at least two quaternary ammonium salts having surface active properties and an additive which is at least one non-cationic surfactant, said salts and additive being present in sufficient amounts for positioning said leukocyte populations relative to one another and relative to a blood cell volume reference point, within the time constraints of said blood cell analyzer.

23. In a method for the size differentiation of at least two populations of leukocytes in blood, the blood being processed through a blood cell analyzer using the Coulter Principle of operation which employs a leukocyte sensing zone, the blood having been first diluted with an electrically conductive isotonically balanced diluent, the improvement wherein said stromatolysing reagent comprises an aqueous solution of at least two quaternary ammonium salts having surface active properties and an additive which is at least one non-cationic surfactant, said salts and additive being present in sufficient

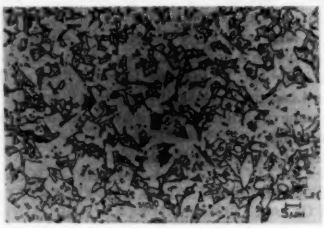
amounts for positioning said leukocyte populations relative to one another and relative to a blood cell volume reference point, within the time constraints of said blood cell analyzer.

4,528,275

MULLITE-CORDIERITE COMPOSITE CERAMIC AND METHOD FOR PREPARATION

James D. Hodge, Cohoes, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 4, 1984, Ser. No. 616,748
Int. Cl.³ C04B *35/18*
U.S. Cl. 501—9 **29 Claims**



1. A polycrystalline body comprised of crystalline mullite phase in an amount ranging from about 50% by weight to about 95% by weight of the total weight of the body and crystalline cordierite phase in an amount ranging from about 5% by weight to about 50% by weight of the total weight of the body, said mullite phase being comprised of from about 71.8 weight % to about 73.3 weight % Al_2O_3 balance SiO_2, said cordierite phase being comprised of about 13.7 weight % MgO, about 34.9 weight % Al_2O_3 and about 51.4 weight % SiO_2, said body having a porosity of less than about 10% by volume of the total volume of said body.

4,528,276

ZEOLITE ION EXCHANGER FOR BUILDERS IN DETERGENTS

Thomas C. Cambell, Huntington Beach, Calif.; Howard S. Sherry, Cherry Hill, N.J.; George C. Schweiker, Ardmore; James S. Falcone, Jr., Devon, both of Pa., and Robert H. Sams, deceased, late of Alden, Pa. (by Ruth W. Sams, Legal Representative), assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 322,790, Nov. 19, 1981, abandoned, and a continuation of Ser. No. 152,897, May 23, 1980, abandoned, which is a continuation-in-part of Ser. No. 49,259, Jun. 18, 1979, abandoned. This application Jan. 3, 1983, Ser. No. 455,151
Int. Cl.³ B01J *20/18, 20/22*
U.S. Cl. 502—62 **18 Claims**

7. An agglomerate that is a combination of separate particles of alkali metal silicates and zeolite and consists of 1 pbw of water-soluble sodium silicate particles and 2 to 6 pbw of water-insoluble Zeolite NaA, said agglomerate being characterized by: (a) disintegrating in 15 seconds or less when exposed to water, thereby dispersing the insoluble zeolite throughout the water; (b) a particle size of 150 to 2000 microns; and (c) less than a 15% difference between the bulk density and the tamped bulk density, said hydrated sodium silicate particles having 1.6 to 2.8 moles of SiO_2 per mole of Na_2O and 15 to 30% by weight, and said Zeolite NaA containing 19 to 25% water.

8. The agglomerate of claim **7** wherein there are 3 to 6 pbw of Zeolite NaA for each pbw of hydrated sodium silicate.

9. The agglomerate of claim **8** wherein there are 2 to 4 pbw of Zeolite Na for each pbw of hydrated sodium silicate and the agglomerate absorbs 40 to 50% liquid nonionic surfactant.

4,528,277

CATALYST FOR OXIDIZING HYDROGEN SULFIDE

Robert H. Hass, Fullerton, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 364,415, Apr. 1, 1982, Pat. No. 4,444,908, which is a continuation-in-part of Ser. No. 191,859, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,033, Apr. 4, 1979, Pat. No. 4,314,983. This application Dec. 28, 1983, Ser. No. 566,277
Int. Cl.³ B01J *23/22, 29/16*
U.S. Cl. 502—79 **12 Claims**

1. A catalyst comprising a vanadium component in combination with a catalytic component selected from the group consisting of tin, bismuth, antimony and the compounds thereof on a support comprising a hydrophobic crystalline material capable of sorbing no more than 0.05 gram of water per gram when the ratio of partial pressure of water vapor at 25° C. to the water saturation pressure at 25° C. is 0.8.

3. A catalyst comprising a vanadium component in combination with a catalytic component selected from the group consisting of tin, bismuth, antimony and the compounds thereof on a support comprising silicalite.

7. A catalyst as defined in claim **1** or **2** wherein said hydrophobic crystalline material comprises a zeolite having a SiO_2/Al_2O_3 molar ratio of from 4.5 to 35, the essential X-ray diffraction pattern of zeolite Y, an ion exchange capacity of not greater than 0.070, a unit cell dimension of from 24.20 to 24.45 °A, a surface area of at least 350 m^2/g (B-E-T), a sorptive capacity for water vapor at 25° C. and a ρ/ρ° of 0.10 of less than 5.00 weight percent and a Residual Butanol Test value of not more than 0.40 weight percent.

4,528,278

CATALYST FOR HYDROFORMYLATION OF OLEFINS

Chao-Yang Hsu, Media, Pa., assignor to Sun Tech, Inc., Philadelphia, Pa.

Filed Apr. 11, 1984, Ser. No. 598,933
Int. Cl.³ B01J *23/42, 27/08, 31/22*
U.S. Cl. 502—153 **6 Claims**

1. A catalyst system for hydroformylation of olefins, which comprises (1) $Pt(acetylacetonate)_2$; (2) a ferrocene-derived ligand; and (3) a Group IVB metal halide.

4,528,279

MONOLITHIC CATALYST FOR EXHAUST GAS PURIFICATION

Yoshihiro Suzuki; Hiroo Kinoshita, both of Toyota; Masayasu Sato, and Masanori Ohara, both of Shizuoka, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Cataler Industrical Co. Ltd., Shizuoka, both of, Japan

Continuation of Ser. No. 354,659, Mar. 4, 1982, abandoned, which is a continuation of Ser. No. 247,007, Mar. 24, 1981, abandoned. This application Mar. 23, 1984, Ser. No. 592,740
Claims priority, application Japan, Nov. 20, 1980, 55-163727
Int. Cl.³ B01J *21/04, 23/10, 23/42, 23/46*
U.S. Cl. 502—200 **5 Claims**

1. A monolithic catalyst, for the purification of exhaust gases from an internal combustion engine, comprising: an inert carrier; a film of alumina and rare earth oxides coated onto the surface of said inert carrier, wherein Ce and La are present in said film at an atomic ratio of Ce/La of 0.05–0.3:1, the total content of rare earth oxides in said film is 17.5–50 wt%, measured as R_2O_3, wherein R is an element of the lanthanide series of the Periodic Table, and Ce and La oxides are present in said film in an amount of greater than 90% by weight of the total rare earth oxides; and said film carries a catalyst component containing platinum and rhodium.

4,528,280
PROCESS FOR PREPARING PHOSPHORUS-VANADIUM MIXED OXIDE CATALYSTS

James T. Wrobleski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,359
Int. Cl.³ B01J *27/14*; C07D *307/60*
U.S. Cl. 502—209 **15 Claims**

1. A process for the preparation of a phosphorus-vanadium mixed oxide catalyst for the production of maleic anhydride which comprises:

(a) contacting a tetravalent vanadium compound, dissolved in an aqueous, non-oxidizing acid medium, with crystalline diphosphoric acid to form a phosphorus-vanadium mixed oxide catalyst precursor;

(b) crystallizing the catalyst precursor from the catalyst precursor aqueous solution in a controlled manner involving at least three cycles of concentrating/diluting wherein a fraction of the liquid from about 0.15 to about 0.85 is removed during the concentrating step and water is added during the diluting step in an amount sufficient to provide a water added/solvent removed volume ratio from about 0.10 to about 10.0, with the proviso that the final liquid-/initial liquid volume ratio is from about 0.20 to about 2.0;

(c) recovering the catalyst precursor crystals;

(d) drying the catalyst precursor;

(e) forming the dried catalyst precursor into structures; and

(f) calcining the catalyst precursor structures at a temperature from about 300° C. to about 600° C.

4,528,281
CARBON MOLECULAR SIEVES AND A PROCESS FOR THEIR PREPARATION AND USE

Robert F. Sutt, Jr., Coraopolis, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1983, Ser. No. 475,796
Int. Cl.³ C01B *13/16*
U.S. Cl. 502—402 **22 Claims**

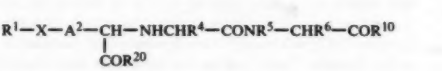
1. A molecular sieve comprising a carbonaceous substrate selected from the group consisting of molecular sieve carbon; calcined char and calcined agglomerated char selected from the group consisting of coconut, peach pits, walnut shells, babassu nut shells, and cherry pits; oxidized and devolatilized agglomerated coal; and calcined agglomerated coal; impregnated with an organic polymer having a molecular weight of at least 400, as determined by vapor phase osmometry, or with an inorganic polymer at a dosage of at least 0.001 weight percent (based on the substrate weight) up to a maximum dosage which still allows the resulting sieve to separate gas or liquid mixtures containing components of at least two different molecular diameters, molecular weights or molecular shapes.

4,528,282
AMIDE DERIVATIVES

John Preston, Knutsford, and William R. Carling, Macclesfield, both of England, assignors to Imperial Chemical Industries, plc, England

Filed Jan. 19, 1983, Ser. No. 459,143
Claims priority, application United Kingdom, Jan. 22, 1982, 8201832
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 514—19 **13 Claims**

1. An amide derivative of the formula;



wherein R^1 is thienyl, furyl, pyrrolyl, pyridyl, benzothienyl, benzofuryl or indolyl which is unsubstituted or which bears one or two halogen or alkyl substituents, wherein X has the formula —CO— or

wherein R^{13} and R^{14}, which may be the same or different, each is alkyl of up to 5 carbon atoms, or R^{13} and R^{14} are joined together to form alkylene of 2 to 5 carbon atoms, wherein A^2 is alkylene of up to 5 carbon atoms, wherein R^4 is hydrogen or alkyl of up to 5 carbon atoms which is unsubstituted or which bears an amino, alkoxycarbonylamino, carboxy or alkoxycarbonyl substituent each of up to 5 carbon atoms, wherein R^5 is hydrogen or alkyl and R^6 is hydrogen or alkyl of up to 5 carbon atoms which is unsubstituted or which bears an indolyl substituent, or R^5 and R^6 together form alkylene or thiaalkylene of 3 or 4 carbon atoms, and wherein R^{10} and R^{20}, which may be the same or different, each is hydrogen or alkoxy of up to 5 carbon atoms;
or a salt thereof where appropriate.

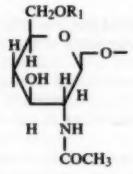
4,528,283
COSMETIC COMPOSITION BASED UPON CHITOSAN DERIVATIVES, NEW CHITOSAN DERIVATIVES AS WELL AS PROCESSES FOR THE PRODUCTION THEREOF

Günther Lang, Mühltal; Harald Wendel, Ober-Ramstadt, and Eügen Konrad, Darmstadt, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,124
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223423
Int. Cl.³ A61K *7/48, 7/06*; C08B *37/08*
U.S. Cl. 514—55 **16 Claims**

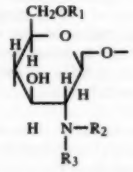
1. Cosmetic composition useful for the treatment of hair or skin, comprising as active agent glyceryl-chitosan composed of macromolecular compounds derived from chitosan and having

(a) 4–40 Mol-% units of the Formula (I)

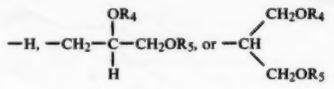


and

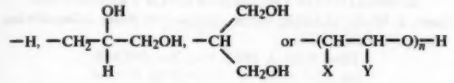
(b) 60–96 Mol-% units of the Formula (II)



wherein R_1, R_2 and R_3 are the same or different and are



wherein R_4 and R_5 are the same or different and are



wherein either X=H and Y=CH_2OH, or Y=H and X=CH_2OH and n=2 to 5, with the proviso that for at least half of the units of the formula II, R_1, R_2 and R_3 are not uniformly H, or their salts with organic or inorganic acids, in a suitable cosmetic carrier.

4,528,284

FUNGICIDAL 2-(AZOLYLMETHYL-1'-YL)-2-ARYL-2-(CYANO, ALKOXYCARBONYL, ALKYLTHIOCARBONYL AND AMINOCARBONYL)-2-PHOSPHORUS ACID ESTERS

Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Walter Kunz, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

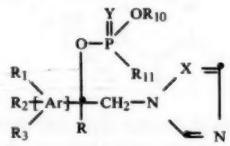
Filed Oct. 5, 1983, Ser. No. 539,217

Claims priority, application Switzerland, Oct. 15, 1982, 6021/82

Int. Cl.[3] **A01N** *57/16, 57/24;* **C07F** *9/65*

U.S. Cl. 514—84 **11 Claims**

1. A phosphoric acid ester of the formula I



(I)

wherein

X is the bridge member —CH= or —N=,

Ar is a phenyl, diphenyl or naphthyl group,

R_1, R_2 and R_3 are each independently hydrogen, nitro, halogen, C_1–C_3alkyl, C_1–C_3alkoxy or C_1–C_3haloalkyl,

R is one of the groups —$COOR_4$, —$COSR_5$,

or —CN,

R_4 is C_2–C_{10}alkenyl which is unsubstituted or substituted by halogen: C_2–C_{10} alkynyl which is unsubstituted or substituted by halogen; or is a C_3–C_8cycloalkyl group or a phenyl group which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, —CN or —CF_3; or is a C_1–C_{12}alkyl chain which from C_2alkyl may be interrupted by oxygen or sulfur and is unsubstituted or substituted by a member selected from the group consisting of halogen, phenyl, —COO—C_1–C_4alkyl, —CO—C_1–C_4alkyl, —CO—phenyl, an unsaturated or saturated 5- or 6-membered ring containing oxygen or sulfur as heteroatom, with each phenyl moiety being unsubstituted or substituted by one or more identical or different nitro groups, halogen atoms, or methyl groups

R_5 is C_1–C_{10}alkyl, or is a phenyl or benzyl group, each unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, —CN or —CF_3,

R_6 and R_7 are each independently hydrogen, C_1–C_6alkyl, C_3–C_7cycloalkyl, or a phenyl or benzyl group in each of which the aromatic ring is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4alkoxy, —CN or —CF_3, or one of R_6 and R_7 is also the —$N(R_8)(R_9)$ group, or both taken together form a 5- or 6-membered saturated or unsaturated heterocyclic ring which may additionally contain 1 or 2 further N-atoms,

R_8 and R_9 are each independently hydrogen, C_1–C_4alkyl or a phenyl radical which is unsubstituted or substituted by halogen, C_1–C_4alkyl, —CN or —CF_3,

R_{10} is C_1–C_{12}alkyl, and

R_{11} is —YR_{12}, C_1–C_{12}alkyl or phenyl,

R_{12} is C_1–C_{12}alkyl and

Y is oxygen or sulfur, or an acid addition salt, quaternary azolium or ammonium salt, or a metal complex thereof,

11. A method of controlling phytophatogenic fungi, insects or acarina or of protecting cultivated plants from attack by such pests, which comprises applying to said plants or to the locus thereof a pesticidally effective amount of a compound of the formula I as claimed in claim **1**.

4,528,285

METHYLENEDIOXY QUINO-BENZOTHIAZINE DERIVATIVES

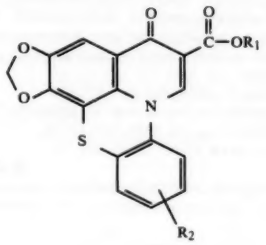
Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 26, 1984, Ser. No. 604,190

Int. Cl.[3] **C07D** *491/14;* **A61K** *31/54*

U.S. Cl. 514—224 **9 Claims**

1. A compound having the formula



wherein R_1 is hydrogen or a carboxy-protecting group, R_2 is one or more groups selected from the group consisting of hydrogen, halogen, nitro, methylenedioxy, carboxyl, cyano, C_1 to C_6 alkyl, halo-substituted C_1 to C_6 alkyl, hydroxy-substituted C_1 to C_6 alkyl, a group having the formula:

—Y—R_3

wherein —Y— is —O— or —S— and R_3 is hydrogen or C_1 to C_6 alkyl, and an amine group having the formula:

wherein R_4 and R_5 are independently hydrogen or C_1 to C_6 alkyl and pharmaceutically acceptable salts thereof.

4,528,286
METHOD OF USING CERTAIN ARYL-MERCAPTO-LOWER-ALKANAMIDES AS ANTISEBORRHEIC AGENTS

Hinrich Möller, and Siegfried Wallat, both of Monheim, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft (KGaA), Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP82/00111, § 371 Date Nov. 15, 1982, § 102(e) Date Nov. 15, 1982, PCT Pub. No. WO82/04391, PCT Pub. Date Dec. 23, 1982

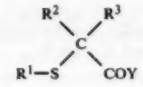
PCT Filed May 21, 1982, Ser. No. 444,588

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121072

Int. Cl.³ A61K *7/06, 7/48*

U.S. Cl. 514—232 **3 Claims**

1. A method for reducing sebaceous cell sebum production in a mammal in need thereof which comprises contacting said sebaceous cell in the skin of said mammal to reduce sebum production of with a topical cosmetic preparation comprising an effective amount one compound having the formula



wherein R^1 is selected from the group consisting of phenyl, C_{1-4}-alkylphenyl, halophenyl, hydroxyphenyl, C_{1-4}-alkoxyphenyl, aminophenyl, acetamidophenyl, naphthyl, diphenyl; R^2 and R^3, independently, are selected from the group consisting of hydrogen and C_{1-4}-alkyl; and Y is $—NR^4R_5$, wherein R^4 and R^5, independently, are selected from the group consisting of hydrogen, C_{1-6}-alkyl, C_{2-3}-hydroxyalkyl, benzyl, anilyl, and taken together piperidinyl and morpholinyl.

4,528,287
6-FLUORO-1, 4-DIHYDRO-4-OXO-7-SUBSTITUTED PIPERAZINYLQUINOLINE-3-CARBOXYLIC ACIDS AND THE METHOD FOR PREPARING THE SAME

Yasuo Itoh, Katsuyamashi; Hideo Kato, Fukuishi; Nobuo Ogawa; Eiichi Koshinaka, both of Katsuyamashi; Tomio Suzuki, Kamishiimura, and Noriyuki Yagi, Katsuyamashi, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi, Japan

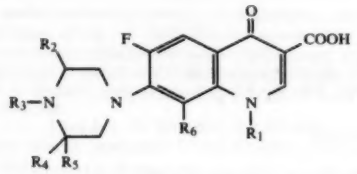
Filed Sep. 17, 1984, Ser. No. 651,423

Claims priority, application Japan, Sep. 19, 1983, 58-171271; Mar. 12, 1984, 59-45664; Jun. 18, 1984, 59-123780

Int. Cl.³ A61K *31/47;* **C07D** *401/04*

U.S. Cl. 514—254 **10 Claims**

1. A 6-fluoro-1,4-dihydro-4-oxo-7-substituted piperazinylquinoline-3-carboxylic acids represented by the general formula (I)



(I)

wherein R_1 is a lower alkyl group having 1 to 4 carbon atoms, a vinyl group, a 2-fluoroethyl group, or a 2-hydroxy-ethyl group; R_2, R_3 and R_4 each is a hydrogen, or a lower alkyl group having 1 to 4 carbon atoms; R_5 is a lower alkyl group having 1 to 4 carbon atoms and R_6 is a hydrogen, or a fluorine and a pharmacologically-acceptable salt thereof.

10. Method for the inhibition of bacteria and for increasing urinary excretion in a subject in need of the same, comprising the step of administering an effective antibacterial and urinary-excretion increasing amount of a compound of claim 1 orally to said patient.

4,528,288
SUBSTITUTED TRIAZOLO[1,5-c]PYRIMIDINES

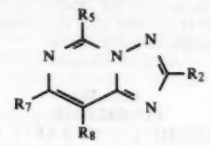
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed May 2, 1983, Ser. No. 490,969

Int. Cl.³ A61K *31/505;* **C07D** *487/04*

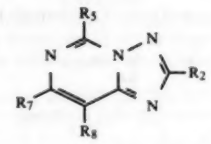
U.S. Cl. 514—258 **8 Claims**

1. A compound of the formula:



wherein R_2 is hydrogen or lower alkyl; R_5 is benzylthio; and R_7 and R_8 are independently hydrogen or lower alkyl; or a pharmaceutically acceptable acid-addition salt thereof.

7. A method for obtaining bronchodilation in a mammal, wherein an effective amount of a bronchodilator compound is administered to said mammal, said bronchodilator compound being of the formula



wherein R_2 is hydrogen, lower alkyl, mercapto, lower alkylthio, lower alkoxy or hydroxy; R_5 is (lower alkyl)amino, di(-lower alkyl)amino, alklthio or benzylthio; R_7 is hydrogen, lower alkyl, halogen or lower alkylthio; and R_8 is hydrogen, lower alkyl or halogen, and is hydrogen or lower alkyl when R_7 is halogen; with the provisos that at least one of R_5 and R_7 is lower alkylthio, (lower alkyl)amino, di(lower alkyl)amino, or benzylthio; and when one of R_5 and R_7 is lower alkylthio, at least another one of R_2, R_5 and R_7 is mercapto, lower alkylthio or lower alkoxy; or a pharmaceutically acceptable acid-addition salt thereof.

4,528,289
CORYNANTHEINE DERIVATES, PROCESSES FOR THEIR PREPARATION, AND THEIR USE

Hermann E. W. Jaggy, Bad Schönborn; Shyam S. Chatterjee, and Bernard L. Gabard, both of Karlsruhe, all of Fed. Rep. of Germany, assignors to Dr. Willmar Schwabe GmbH & Co., Fed. Rep. of Germany

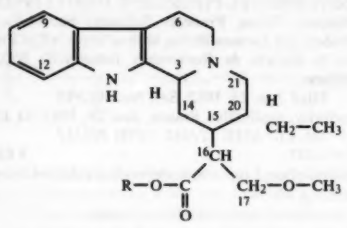
Filed Jan. 28, 1983, Ser. No. 461,949

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204960

Int. Cl.³ C07D *459/00;* **A61K** *31/40*

U.S. Cl. 514—285 **5 Claims**

1. Corynantheine compounds having the formula:



(I)

wherein R is a hydrogen or alkali metal atom, an ammonium group or an alkyl group having up to 4 carbon atoms; and the physiologically acceptable acid-addition or amine salts thereof.

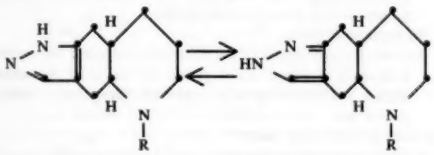
4,528,290

STIMULATING DOPAMINE D-1 RECEPTORS

David T. Wong, and Mark M. Foreman, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 30, 1984, Ser. No. 575,126
Int. Cl.³ A61K *31/47, 31/495*
U.S. Cl. 514—293 **3 Claims**

1. A method for stimulating dopamine D-1 receptors which comprises administering to a mammal a dopamine D-1 receptor stimulating amount of a trans-(+) stereoisomer existing as a tautomeric part of the formula



I Ia

wherein R is methyl, ethyl, n-propyl or allyl.

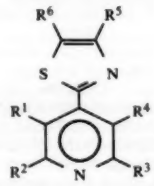
4,528,291

2-(4'-PYRIDINYL)-THIAZOLE COMPOUNDS AND THEIR USE IN INCREASING CARDIAC CONTRACTILITY

Joseph T. Witkowski, Morris Township, Morris County, and Brooks R. Sunday, Oakland, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 22, 1982, Ser. No. 391,061
Int. Cl.³ C07D *417/04;* A61K *31/425*
U.S. Cl. 514—301 **19 Claims**

1. A compound of the formula:



wherein
R^1, R^2, R^3 and R^4 are independently selected from
(i) hydrogen,
(ii) halogen,
(iii) lower alkyl,
(iv) lower alkoxy,
(v) hydroxy, and
(vi) amino,
R^5 and R^6 are independently selected from
(i) hydrogen with the proviso that R^5 and R^6 are not both hydrogen,
(ii) lower alkyl with the proviso that when R^1, R^2, R^3, R^4 and R^6 are hydrogen and R^5 is not lower alkyl,
(iii) lower alkoxy,
(iv) hydroxy, with the proviso that when R^1, R^2, R^3 and R^4 are hydrogen and R^5 is hydroxy, R^6 is not lower alkyl,
(v) $-NR^7R^8$ wherein R^7 and R^8 are the same or different and are independently selected from lower alkyl or hydrogen,
(vi) trifluoromethyl,
(vii) hydroxy lower alkyl,
(viii) cyano,
(ix)

wherein R^{11} and R^{12} are the same or different and are independently selected from hydrogen, lower alkyl and hydroxy lower alkyl, and Y is sulfur or oxygen,
(x)

(C) the pyridinyl N-oxides thereof; and
(D) pharmaceutically acceptable salts thereof.

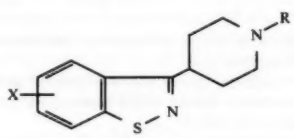
4,528,292

ANTIHYPERTENSIVE 1,2-BENZISOTHIAZOLE PIPERIDINES

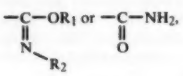
Joseph T. Strupczewski, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 23, 1984, Ser. No. 603,264
Int. Cl.³ C07D *417/04;* A61K *31/425*
U.S. Cl. 514—321 **13 Claims**

1. A compound of the formula

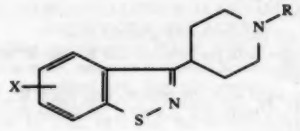


where X is hydrogen, halogen, loweralkoxy, loweralkyl, nitro, amino or trifluoromethyl; and R is

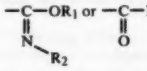


R_1 being loweralkyl, cycloalkylloweralkyl or a loweralkyl substituted with an amino, loweralkylamino or diloweralkylamino, and R_2 being hydrogen or loweralkyl; or a pharmaceutically acceptable acid addition salt thereof, the term cycloalkyl signifying an alicyclic group of 3 to 6 carbon atoms.

13. An antihypertensive composition comprising an effective amount of a compound of the formula



where X is hydrogen, halogen, loweralkoxy, loweralkyl, nitro, amino or trifluoromethyl; and R is



R_1 being loweralkyl, cycloalkylloweralkyl or a loweralkyl substituted with an amino, loweralkylamino or diloweralkylamino, and R_2 being hydrogen or loweralkyl; or a pharmaceutically acceptable acid addition salt thereof and an inert adjuvant, the term cycloalkyl signifying an alicyclic group of 3 to 6 carbon atoms.

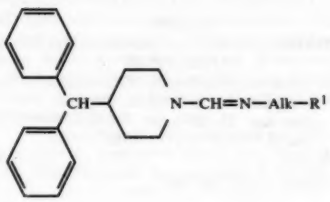
4,528,293

HETEROAROMATIC DERIVATIVES OF IMINOMETHYL PIPERIDINES AND USE TO INHIBIT GASTRIC ACID SECRETION

Malcolm K. Scott, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Oct. 11, 1983, Ser. No. 540,265
Int. Cl.[3] C07D *401/12;* **A61K** *31/455*
U.S. Cl. 514—323 **17 Claims**

1. A 4-diphenylmethyl-1-iminomethylpiperidine of the following formula (I):



(I)

wherein

Alk is a divalent straight or branched chain alkylene unit of 1 to 12 carbons; and

R^1 is a heterocyclic group selected from the group consisting of pyrrole or indole, which heterocyclic group may be optionally substituted:

(a) on a 6-membered ring carbon thereof by one or two substituents selected from the group consisting of alkyl of 1 to 6 carbons, alkoxy of 1 to 6 carbons, alkylthio of 1 to 6 carbons, hydroxy, mercapto, nitro, amino, alkylamino of 1 to 6 carbons, diamino, trifluoromethyl, alkanoylamino of 2 to 8 carbons, halo, carboxy, carbamoyl, or carbonyl;

(b) on the nitrogen atom of the pyrrole or indole rings by alkyl of 1 to 6 carbons, phenyl, or phenyl(alkyl of 1 to 6 cargons); and

(c) on a carbon atom of a 5-membered ring thereof by one or two substituents selected from the group consisting of alkyl of 1 to 6 carbons, carboxy or phenyl; and

the pharmaceutically-acceptable salts thereof.

13. A pharmaceutical composition for inhibiting gastric acid secretion which comprises a gastric acid secretion inhibiting amount of a piperidine of claim **1**, in association with a pharmaceutically-acceptable carrier.

4,528,294

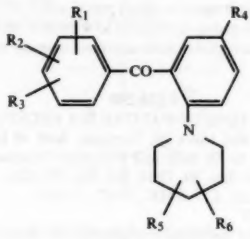
BENZOYL-PHENYL-PIPERIDINE DERIVATIVES

Bernard Majoie, Dijon; Francois Bellamy, Saulon-La-Rue; Pierre Dodey, and Jacques Robin, both of Dijon, all of France, assignors to Societe de Recherches Industrielle S.O.R.I., Paris, France

Filed Jun. 24, 1982, Ser. No. 391,915
Claims priority, application France, Jun. 29, 1981, 81 12745
Int. Cl.[3] A61K *31/445;* **C07D** *295/12*
U.S. Cl. 514—327 **5 Claims**

1. A benzoyl-phenyl-piperidine derivative selected from the group consisting of:

(i) 2-piperidinobenzophenones of the formula



(I)

in which:

R_1, R_2 and R_3 are identical or different and each represents hydrogen, a hydroxy group, CF_3, a halogen, a lower alkyl group having 1 to 4 carbon atoms, or a lower alkoxy group having 1 to 4 carbon atoms;

R_4 represents NH_2;

R_5 and R_6 are identical or different and each represents hydrogen, a lower alkyl group having 1 to 4 carbon atoms, a hydroxy group, a phenyl group or a benzyl group; and

(ii) acid addition salts thereof.

2. A therapeutical composition which comprises, in association with a physiologically acceptable excipient, a pharmaceutically effective amount of a compound of formula (I) according to claim **1** or one of its non-toxic acid addition salts.

4,528,295

COMPOSITION AND METHOD FOR REDUCING BLOOD ACETALDEHYDE LEVELS

Boris Tabakoff, R.F.D. 2, Elizabeth, Ill. 61028

Filed Aug. 15, 1983, Ser. No. 523,397
Int. Cl.[3] A61K *31/195, 31/44*
U.S. Cl. 514—345 **8 Claims**

1. A method for reducing elevated blood acetaldehyde level resulting from alcohol ingestion in a patient which consists essentially of administering to the patient an effective amount of methionine prior to alcohol ingestion.

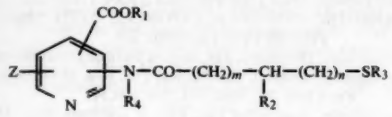
4,528,296

DERIVATIVES OF AMINOPYRIDINECARBOXYLIC ACIDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Vittorio Vecchietti; Giorgio Ferrari, both of Milan, and Cesare Casagrande, Arese, all of Italy, assignors to Simes, Societa Italiana Medicinalle Sintetici, Milan, Italy

Filed Dec. 2, 1983, Ser. No. 557,584
Claims priority, application Italy, Dec. 3, 1982, 24576 A/82
Int. Cl.[3] C07D *213/80, 213/79, 213/75;* **A61K** *31/455*
U.S. Cl. 514—346 **12 Claims**

1. A compound of formula



where

Z is hydrogen, alkyl having from 1 to 3 carbon atoms, halogen or alkoxy having from 1 to 3 carbon atoms;

R1 is hydrogen, alkyl having from 1 to 6 carbon atoms, aryl alkyl having from 7 to 12 carbon atoms, aryl having 6 carbon atoms;

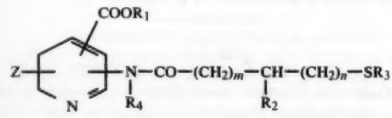
m and n are an integer of from 0 to 4 each provided, however, that m+n is lower than 5;

R2 is hydrogen, alkyl having from 1 to 6 carbon atoms or arylalkyl having from 7 to 12 carbon atoms;

R3 is hydrogen or acyl of a carboxylic acid having from 1 to 8 carbon atoms;

R4 is hydrogen or alkyl having from 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof with organic or inorganic acids.

3. Pharmaceutical composition containing a compound of formula



where

Z is hydrogen, alkyl having 1 to 3 carbon atoms, halogen or alkoxy having from 1 to 3 carbon atoms;

R_1 is hydrogen, alkyl having from 1 to 6 carbon atoms, aryl alkyl having from 7 to 12 carbon atoms, aryl having 6 carbon atoms;

m and n are an integer of from 0 to 4 each provided, however, that m+n is lower than 5;

R_2 is hydrogen, alkyl having from 1 to 6 carbon atoms or aryl alkyl having from 7 to 12 carbon atoms;

R_3 is hydrogen or acyl of a carboxylic acid having from 1 to 8 carbon atoms;

R_4 is hydrogen or alkyl having from 1 to 3 carbon atoms; or a pharmaceutically acceptable salt thereof with organic or inorganic acids and a carrier, the amount of the compound of formula (I) being effective to inhibit enkephalinase.

4,528,297

NEUROLEPTIC 3-AZETIDINYLETHYL-1-PHENYL-2-IMIDAZOLIDINONES

Luigi Fontanella, Sassari, Italy; Edoardo Martinelli, Zurich, Switzerland, and Alessandro Assandri, Mariano Comense, Italy, assignors to Gruppo Lepetit S.p.A., Italy

Filed Mar. 4, 1983, Ser. No. 471,988

Claims priority, application Italy, Mar. 9, 1982, 20019 A/82

Int. Cl.³ A61K *31/415;* **C07D** *403/06*

U.S. Cl. 514—392 **4 Claims**

1. The compound 1-(3-chloro-4-hydroxyphenyl)-3-[2-(3,3-dimethylazetidin-1-yl)ethyl]-2-imidazolidinone or a pharmaceutically acceptable salt thereof.

3. A method of relieving the symptoms of neuroses and psychoses in a person in need thereof which comprises the daily administration of from 0.2 mg to 3.0 mg/kg of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,528,298

ANTIINFLAMMATORY IMIDAZOLE DERIVATIVES

Ulrich Niedballa, and Irmgard Böttcher, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

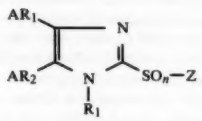
Division of Ser. No. 280,163, Jul. 2, 1981, Pat. No. 4,402,960. This application Jul. 22, 1983, Ser. No. 516,395

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025484

Int. Cl.³ A61K *31/415*

U.S. Cl. 514—398 **3 Claims**

1. A method of treating inflammation in a patient in need of such treatment comprising administering to the patient an antiinflammatorily effective amount of a compound of the formula



wherein

AR_1 and AR_2 each independently is phenyl;

R_1 is hydrogen or alkyl of 1–6 carbon atoms;

n is 0, 1 or 2; and

Z is phenyl substituted by nitro or nitro and halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, amino, C_{1-6}-alkanoylamino or trifluoromethyl;

or a physiologically acceptable salt thereof with an acid.

4,528,299

1-(2,3-DIMETHYL-4-METHOXYPHENYL)-2-METHYL-3-(1-PYRROLIDINYL)-1-PROPANONE AND ANTI-SPASTIC USE THEREOF

Hitoshi Uno, Takatsuki; Tadahiko Karasawa, Toyonaka; Tatsuya Kon, Ashiya, and Tsugutaka Ito, Suita, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 7, 1983, Ser. No. 530,096

Claims priority, application Japan, Sep. 7, 1982, 57-156081

Int. Cl.³ C07D *207/04;* **A61K** *31/40*

U.S. Cl. 514—428 **10 Claims**

1. 1-(2,3-Dimethyl-4-methoxyphenyl)-2-methyl-3-(1-pyrrolidinyl)-1-propanone or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating spasticity in mammals which comprises administering to said mammals in need of such treatment an effective antispastic amount of 1-(2,3-dimethyl-4-methoxyphenyl)-2-methyl-3-(1-pyrrolidinyl)-1-propanone or a pharmaceutically acceptable acid addition salt thereof.

4,528,300

PROCESS FOR PRODUCING DIMENSIONALLY STABLE POLYOLEFIN FOAMS USING ENVIRONMENTALLY ACCEPTABLE BLOWING AGENT SYSTEMS

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1984, Ser. No. 575,627

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—79 **20 Claims**

1. A process for preparing closed-cell olefin polymer foamed articles having increased maximum achievable cross-sectional areas and having good dimensional stability which process comprises the steps of:

(A) heat plastifying a normally solid olefin polymer resin;

(B) admixing said heat plastified resin under elevated temperature and pressure with

(1) a stability control agent and

(2) a mixed blowing agent system selected from the group consisting of

(a) from about 50 to about 95 weight percent of 1-chloro-1,1-difluoroethane and from about 5 to about 50 weight percent of an aliphatic hydrocarbon composition and/or a halogenated hydrocarbon composition, such composition(s) having a normal atmospheric boiling point of from about 0° C. to about 50° C., the system having a saturated vapor pressure at 100° C. of less than about 21 kg/cm^2 but greater than about 17kg/cm^2; and

(b) from about 50 to about 95 weight percent of 1,1-difluoroethane and from about 5 to about 50 weight percent of an aliphatic hydrocarbon composition and/or halogenated hydrocarbon compositions, such aliphatic and/or halogenated hydrocarbon composition(s) having a normal atmospheric boiling point of from about 0° C. to about 50° C., the system having a saturated vapor pressure at 100° C. of less than about 32 kg/cm^2 but greater than about 24 kg/cm^2;

the weight percentages of the components in the mixed blowing agent systems being based on the total weight of the mixed blowing agent system,

(C) extruding the resultant resin, stability control agent and blowing agent mixture into a zone of lower pressure; and

(D) cooling the mixture to thereby form an olefin polymer foam.

4,528,301

OXYGEN PERMEABLE, STYRENE BASED, CONTACT LENS MATERIAL

Billy T. Upchurch, Norfolk, Va., assignor to GBF, Inc., Virginia Beach, Va.

Filed Jun. 23, 1983, Ser. No. 506,975

Int. Cl.³ C08J *3/28;* **C08L** *31/08, 53/00, 83/00*

U.S. Cl. 523—107 **19 Claims**

1. A copolymer prepared by copolymerizing a reaction mixture comprising:

(1) about 40–97% by weight of a styrene component selected from styrene, a ring substituted styrene such as alphamethyl styrene or vinyltoluene, and mixtures thereof; and

(2) about 1–20% by weight of a vinyl alcohol ester component selected from vinyl acetate, vinyl alcohol esters prepared by addition of either aliphatic or aromatic carboxylic acids having from 1 to about 10 carbon atoms to acetylene or substituted alkynes, and mixtures thereof; and

(3) about 1–20% by weight of a polyethylene glycol ester component selected from pentaethyleneglycol monomethacrylate, polyethylene glycol esters having from 2 through 10 PEG units (CH_2CH_2O) monoesterified with a carboxylic acid having at least one vinyl or substituted vinyl group such as acrylic or methacrylic acid, and mixtures thereof; and

(4) about 1–20% by weight of a substituted polysiloxane or substituted silane component selected from methyl polysiloxane, dimethyl polysiloxane, ethyl polysiloxane, phenyl polysiloxane, methoxy polysiloxane, vinyl polysiloxane, fluoropropyl polysiloxane, cyano polysiloxane, dimethylphenylmethyl polysiloxane, a methyl substituted silane, a dimethyl substituted silane, an ethyl substituted silane, a phenyl substituted silane, a methoxy substituted silane, a vinyl substituted silane, a fluoropropyl substituted silane, a cyano substituted silane, a dimethylphenylmethyl substituted silane, and mixtures thereof.

19. A contact lens comprising the copolymer as defined by any one of claims 1–9, 10–12 or 13–18.

4,528,302

MOULDINGS AND THE PRODUCTION THEREOF COMPRISING CEMENT REINFORCED WITH PAN FIBERS CONTAINING ZR.

Dieter Brokmeier, Dormagen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,342

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247351

Int. Cl.³ C08K *9/02, 7/02;* **B29D** *3/02*

U.S. Cl. 523—204 **4 Claims**

1. Mouldings made from cement reinforced by polyacrylonitrile fibers which contain a zirconium salt.

4,528,303

POLYMER/FILLER MOLDING COMPOSITIONS

Christian Segaud, Aulnay Sous Bois, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 24, 1983, Ser. No. 497,721

Claims priority, application France, May 28, 1982, 82 09524

Int. Cl.³ C08K *9/06, 3/34*

U.S. Cl. 523—212 **20 Claims**

1. A moldable composition of matter comprising (i) a polymeric matrix and (ii) an inorganic reinforcing filler therefor, said reinforcing filler consisting essentially of an intimate admixture of enstatite and silica prepared by calcination of a precursor clay at a temperature of at least 800° C.

4,528,304

POLYAMIDE RESIN COMPOSITION

Tokuo Yoshimura, Machida; Kunio Hagiwara, Yokohama, and Akira Aiba, Fujisawa, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,864

Claims priority, application Japan, Jun. 19, 1983, 58-109493

Int. Cl.³ C08K *3/34*

U.S. Cl. 523—216 **5 Claims**

1. A polyamide resin composition consisting essentially of 30 to 70 weight percent polyamide resin, 20 to 50 weight percent of glass fiber and 10 to 50 weight percent of ground rock wool, said ground rock wool having an aspect ratio of between 50 and 100.

4,528,305

EPOXY RESIN MODELING STOCK

Rebecca D. Henry, Holt, Mich., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 13, 1984, Ser. No. 599,879

Int. Cl.³ C08J *9/32*

U.S. Cl. 523—219 **15 Claims**

1. A cured epoxy resin composition having a glass transition temperature (Tg) over 300° F. (149° C.) coupled with a coefficient of thermal linear expansion (CTE) of less than 1.0×10^{-5} in/in/°F. (or 1.8×10^{-5} cm/cm/°C.) in the 75°–105° F. (24°–41° C.) range and of less than 1.9×10^{-5} in/in/°F. (or 3.4×10^{-5} cm/cm/°C.) in the 100°–350° F. (38°–177° C.) range, which comprisels the cured product of

(a) one or more epoxy resins,

(b) one or more aromatic amine hardeners; or a mixture of said aromatic amine hardener or hardeners with up to 25% by weight of component (b) of an aliphatic amine hardener, wherein based on the total weight of components (a), (b) and (c), the % by weight of (a) plus (b) is from 80 to 50% by weight and the amount of component (b) is essentially that needed provide one amine moiety for each epoxy moiety in component (a), and

(c) from 20 to 50% by weight of at least three fillers selected from the group consisting of glass fibers, glass microspheres, graphite fibers and mica in proportions roughly of 2:1:1:2, respectively.

4,528,306

SOFT VINYL CHLORIDE RESIN COMPOSITION

Koga Shigehiro; Kanazawa Yoshihisa; Okamoto Takeshi; Yamanouchi Masafumi, and Shudo Kazumichi, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 20, 1984, Ser. No. 602,336
Claims priority, application Japan, Apr. 27, 1983, 58-74500
Int. Cl.[3] C08K *7/22, 7/26, 7/28, 5/04*
U.S. Cl. 523—219 4 Claims

1. A soft vinyl chloride composition having a light weight, superior abrasion resistance and a lusterless appearance comprising a blend of

(a) a soft vinyl chloride composition having a light weight, superior abrasion resistance and a lusterless appearance comprising a blend of

(a) 100 parts by weight of a vinyl chloride copolymer consisting of

(1) 99.0 to 99.95% by weight of vinyl chloride, and

(2) 1.0 to 0.5% by weight of a polyethylene glycol diacrylate and/or a polyethylene glycol dimethacrylate, both having 40 to 50 polymerization units of ethylene glycol,

(b) 5 to 100 parts by weight of a filler having

(1) a specific gravity of 0.7 or less

(2) a particle diameter of 300 microns or less, and

(3) a compression strength of at least 70 Kg/cm^2, and

(c) 30 to 150 parts by weight of a plasticizer.

4,528,307

RADIATION HARDENABLE PRIMER

Karl Fuhr, and Hans-Joachim Freier, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,282
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235610
Int. Cl.[3] C09D *3/80;* C03C *25/02;* C04B *41/22;* C08K *7/02*
U.S. Cl. 523—440 7 Claims

1. A radiation-hardenable primer comprising at least one prepolymer containing acryloyl groups, methacryloyl groups or both, and organic or inorganic fibers having a fiber length distribution curve with its maximum in the region of 50 to 600 μm.

4,528,308

EPOXY RESIN CURATIVES

Harold G. Waddill, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 25, 1983, Ser. No. 516,505
Int. Cl.[3] C08G *59/50*
U.S. Cl. 523—466 14 Claims

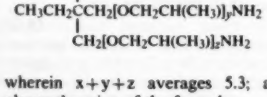
1. An epoxy resin composition comprising:

(A) a liquid diepoxide of molecular weight 350 to 400, and

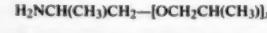
(B) an effective amount of a curing agent which curing agent comprises a 1:2 to 1:10 mixture of

(1) an imidazole compound selected from the group consisting of imidazole and substituted imidazole, and

(2) a polyoxyalkylenepolyamine of molecular weight 200 to 2000 selected from the group consisting of the polyoxyalkylenepolyamine of the formula:



wherein x+y+z averages 5.3; and the polyoxyalkylenepolyamine of the formula:



wherein x averages from 2.6 to 33.1.

4,528,309

METHOD FOR THE PRODUCTION OF CELLULOSIC BOARD MATERIALS

Helgesson Göte, Vallentuna; Månsson Björn, Sundsvall, and Wallin Nils-Håkan, Vällingby, all of Sweden, assignors to AB Casco, Stockholm, Sweden

Continuation of Ser. No. 363,624, Mar. 30, 1982, abandoned. This application Oct. 5, 1983, Ser. No. 538,815
Claims priority, application Sweden, Apr. 28, 1978, 7804942
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.[3] C08L *1/02;* B29J *5/00*
U.S. Cl. 524—13 5 Claims

1. A method for the production of cellulosic board materials from cellulose containing components bonded by formaldehyde-based glues, comprising the steps of:

(a) providing a cellulosic particulate material in the form of chips, sawdust or cutter shavings, such material having a moisture content below 6 percent by weight,

(b) mixing at least a part of the material from step (a) with a water dispersion, containing between 5 and 50 percent by weight of wax and 5 to 50 percent by weight of urea, the concentrations being adapted to avoid subsequent drying of the material, in an amount sufficient to give between 0.2 and 2 weight percent of dry urea calculated on dry cellulosic material, so that the urea penetrates into and is retained in the particulate material,

(c) adding a urea-formaldehyde glue with a mole ratio of formaldehyde to urea within the range of 1.1:1 to 1.4:1, or such a glue modified with melamine to the particulate cellulosic material after the formaldehyde absorbing material has penetrated into the particulate cellulosic material,

(d) shaping the material resulting from step (c) and having a moisture content below 14 percent by weight into a desired form, and

(e) consolidating the shaped material by application of heat and pressure into a cellulosic board.

4,528,310

GLASS-FILLED POLY(ARYLENE SULFIDE) COMPOSITIONS CONTAINING ORGANOSILANES

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 300,859, Sep. 10, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,799
Int. Cl.[3] C08K *5/54*
U.S. Cl. 524—86 21 Claims

1. A composition comprising poly(arylene sulfide), glass and at least one organosilane selected from the group consisting of: 3-N-(Trimethoxysilylpropyl)poly(ethylenimine), Diethylamino-3-trimethoxysilylpropyldisulfide, and 3-(Diethylamino)propyltrimethoxysilane.

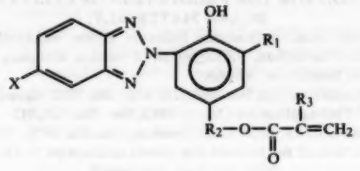
4,528,311

ULTRAVIOLET ABSORBING POLYMERS COMPRISING 2-HYDROXY-5-ACRYLYLOXYPHENYL-2H-BENZOTRIAZOLES

Charles D. Beard, Sierra Madre, Calif.; Akira Yamada, Kyoto, Japan, and Namassivaya Doddi, Upland, Calif., assignors to Iolab Corporation, Covina, Calif.

Filed Jul. 11, 1983, Ser. No. 512,860
Int. Cl.[3] C08F *120/26, 120/36*
U.S. Cl. 524—91 23 Claims

1. A compound of the formula



wherein

X is H or halogen,

R_1 is selected from the group consisting of H, CH_3 and t-alkyl of 4 to 6 carbons,

R_2 is C_2–C_{10} alkylene which may be straight chain or branched, and

R_3 is H or CH_3; and

homopolymers thereof.

4,528,312

DEGRADED POLYOLEFIN CONTAINING EXTRUSION COATING COMPOSITIONS HAVING GOOD ADHESION TO A SUBSTRATE AT FAST COATING SPEEDS

Ray Edwards, Henderson, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1984, Ser. No. 625,331

Int. Cl.[3] C08K *5/20;* **C08L** *23/06, 23/10, 93/04*

U.S. Cl. 524—232 **26 Claims**

1. An extrusion coating composition having a flow rate of 5 to 40 dg/min. at 230° C. which provides coatings of less than 1 mil which have heat seal strengths of at least 7 kg. per linear 2.5 cm. at coating speeds greater than 180 m./min. comprising a blend of (1) about 90 to 75 percent, by weight, of at least one degraded crystalline polypropylene or propylene containing copolymer containing at least 80 weight percent propylene and having a melt flow rate of 1 to 100 dg/min. at 230° C., and (2) about 2.5 to 15 percent, by weight, of at least one polyethylene having a density of 0.916 to 0.925, a melt index at 190° C. of 2 to 7, and a swell ratio of about 1.5 to 2.2, about 0.5 to 12.5 percent, by weight, of a hydrocarbon tackifying resin, and about 0.2 to 1.0 percent, by weight, fatty acid amide containing 16 to 40 carbon atoms.

4,528,313

POLYDIMETHYLSILOXANES HAVING IMPROVED THERMAL STABILITY

Terence J. Swihart, Essexville, Mich., and James E. Jones, Elkhart, Ind., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 15, 1984, Ser. No. 620,972

Int. Cl.[3] C08K *5/04*

U.S. Cl. 524—397 **12 Claims**

1. A silicone composition having improved heat stability, said composition comprising:

(A) from 0.004 to 0.10 percent by weight of iron acetylacetonate;

(B) from 0.004 to 0.10 percent by weight of nickel acetylacetonate;

(C) from 0.004 to 0.10 percent by weight of cerium acetylacetonate;

(D) from 0 to 30 percent by weight of a carboxylic acid having from 2 to 9 carbon atoms; and

(E) from 69.7 to 99.988 percent by weight of alpha,omega-bis(trimethylsiloxy)polydimethylsiloxane fluid, all of the above percents being based on the total weight of the composition.

4,528,314

TRANSPARENT MEMBRANE STRUCTURES

Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 511,705, Jul. 7, 1983, Pat. No. 4,472,470. This application Mar. 26, 1984, Ser. No. 593,322

Int. Cl.[3] C08G *77/38;* **C08K** *3/22;* **C08L** *83/04*

U.S. Cl. 524—407 **42 Claims**

1. A curable silicone coating composition which is resistant to dirt pickup, consisting essentially of:

(a) 100 parts by weight of a liquid vinyl chainstopped polysiloxane having the formula,

where R and R^1 are monovalent hydrocarbon radicals free of aliphatic unsaturation with at least 50 mole percent of the R^1 groups being methyl, and where n has a value sufficient to provide a viscosity of up to 500 centipoise at 25° C.;

(b) 75 to 125 parts by weight of a solid resinous organopolysiloxane copolymer comprising $(R^2)_3SiO_{0.5}$ units and SiO_2 units, where R^2 is selected from the group consisting of vinyl radicals and monovalent hydrocarbon radicals free of aliphatic unsaturation, where the molar ratio of $(R^2)_3SiO_{0.5}$ units to SiO_2 units is from about 0.5:1 to about 1:1, and where from about 1.5 to about 10 mole percent of the silicon atoms contain silicon-bonded vinyl groups;

(c) a platinum or platinum-containing catalyst; and

(d) a liquid organohydrogenpolysiloxane having the formula,

$$(R)_a(H)_bSiO_{(4-a-b)/2}$$

sufficient to provide from about 0.5 to about 1.0 silicon-bonded hydrogen atoms per silicon-bonded vinyl group, where R is as previously defined, a has a value of from about 1.0 to about 2.1, b has a value of from about 0.1 to about 1.0, and the sum of a and b is from about 2.0 to about 2.7, there being at least two silicon-bonded hydrogen atoms per molecule.

3. The composition of claim 1, further consisting essentially of a finely divided inorganic filler.

17. The composition of claim 3, wherein the finely divided inorganic filler is selected from the group consisting of ground quartz, titanium dioxide, ferric oxide, chromic oxide, glass fibers, calcium carbonate, carbon black and talc.

4,528,315

PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS AND THEIR APPLICATION

Herbert Eck; Manfred Hannebaum, and Christof Kemenater, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

PCT No. PCT/EP83/00149, § 371 Date Jul. 20, 1983, § 102(e) Date Jul. 20, 1983, PCT Pub. No. WO84/00369, PCT Pub. Date Feb. 2, 1984

PCT Filed Jun. 9, 1983, Ser. No. 518,308

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227090

Int. Cl.[3] C08L *29/04*

U.S. Cl. 524—458 **18 Claims**

1. In a process for the preparation of aqueous polymer dispersions with solids contents of 20 to 75 wt%., calculated with respect to the total weight, which are stabilized by a protective colloid, by single-step polymerization of vinyl halides and/or vinyl alkanoates, together with 0 to 50 wt%., calculated with respect to the total weight of the monomers that are liquid under the reaction conditions, of other copolymerizable compounds containing unsaturated ethylene bonds, at temperatures

of 0° to 120° C. and pressure of up to 200 bar, with the aid of at least partly water-soluble radical initiator systems, the improvement comprising the metering of protective colloid as first dispersing agent begins only after a conversion of 1 to 60 wt%., calculated with respect to the total weight of the monomers that are liquid under the reaction conditions.

4,528,316

CREPING ADHESIVES CONTAINING POLYVINYL ALCOHOL AND CATIONIC POLYAMIDE RESINS

Dave A. Sorens, Winnebaco County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 542,918, Oct. 18, 1983, Pat. No. 4,501,640. This application Oct. 18, 1984, Ser. No. 661,859

Int. Cl.³ C08L *29/04, 77/06*

U.S. Cl. 524—503 **9 Claims**

1. An aqueous admixture consisting essentially of water, polyvinyl alcohol, and a water-soluble, thermosetting, cationic polyamide resin which is phase-compatible with the polyvinyl alcohol, said cationic polyamide resin comprising the reaction product of an epihalohydrin and a polyamide containing the recurring group

$$—NH(C_nH_{2n}HN)_x—CORCO—$$

wherein n and x are each 2 or more and R is a saturated aliphatic chain having 3–10 carbon atoms, said admixture containing from about 96 to about 99.9 weight percent water.

4,528,317

NON-AQUEOUS DISPERSIONS BASED ON CAPPED STABILIZERS AND REACTANTS COMPRISING POLYFUNCTIONAL MONOMERS II

Ares N. Theodore, Farmington Hills, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 5, 1983, Ser. No. 455,687

Int. Cl.³ C08K *5/01;* **C08L** *51/08*

U.S. Cl. 524—504 **14 Claims**

1. A stable dispersion containing crosslinked polymer particles characterized in that said particles are formed by addition polymerization of:

(a) between about 0.8 and about 20 weight percent each of first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other; and

(b) between about 98.4 and about 60 weight percent of at least one other monoethylenically unsaturated monomer; in the presence of (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer, wherein the reaction is carried out at elevated temperatures such that the dispersion polymer first forms and then is crosslinked, and wherein said stabilizer comprises the reaction product of:

(A) acrylic polymer-adduct having hydroxyl functionality and being the reaction product of:

(a) long chain hydrocarbon molecules having only one reactive group; and

(b) acrylic polymer (i) having a number average molecular weight of between about 1000 and about 10,000 and (ii) containing pendant functionality capable of reacting with said reactive group of said hydrocarbon molecule;

wherein said hydroxyl functionality on said acrylic polymer-adduct is either initially present on said acrylic polymer, generated in situ, or both initially present and generated in situ and wherein said hydrocarbon molecule and said acrylic polymer are reacted in amounts so as to provide at least 1.0 moles of said hydrocarbon molecules per each mole of said acrylic polymer; and

(B) ethylenically unsaturated monoisocyanates; wherein said adduct (A) and said monoisocyanates (B) are reacted in amounts so as to provide between about 0.1 and about 1.0 reactive isocyanates per each hydroxyl functionality present on said acrylic polymer-adduct (A).

14. Crosslinked polymer particles obtained by removal of said solvent from said dispersion formed in claim 1.

4,528,318

AQUEOUS COATING COMPOSITION, AND ITS PRODUCTION

Sakuichi Konishi, Ikoma; Naohito Shingo, Katano, and Mathuo Shibayama, Ohtsu, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 31, 1983, Ser. No. 462,235

Claims priority, application Japan, Feb. 15, 1982, 57-23157

Int. Cl.³ C08L *51/00*

U.S. Cl. 524—504 **3 Claims**

1. An aqueous coating composition which comprises (I) a water dispersible or water soluble resin containing carboxy groups in its structure, said resin selected from the group consisting of an alkyd resin, a polyester resin, a maleinated oil resin, a maleinated polyalkadiene, an acrylic resin and a urethane resin, which resin has an acid value of 20 to 200 and a number average molecular weight of 500 to 30,000 and is rendered dispersible or soluble in an aqueous medium by ionization, when the carboxyl group is neutralized with a basic substance, and (II) a water-insoluble resin powder having an acid value of 5 to 100 obtained by the reaction between a carboxyl group-containing resin selected from the group consisting of a polyester resin and an acrylic resin having an acid value of 20 to 300 in a solid state at room temperature and a monoepoxy compound selected from the group consisting of olefin oxides, octylene oxide, butyl glycidyl ether, glycidyl methacrylate, glycidyl p-tert-butylbenzoate, allyl glycidyl ether, a glycidyl tert-alkanoate, styrene oxide, phenyl glycidyl ether, p-butyl-phenol glycidyl ether, cresyl glycidyl ether, 3-pentadecylphenyl glycidyl ether, cyclohexenevinyl monooxide, dipentene monooxide, alpha-pinene oxide and glycidol or a monoisocyanate compound selected from the group consisting of an aromatic isocyanate and an aliphatic isocyanate, said reaction being conducted in the presence of a catalyst, and wherein the weight proportion of the aqueous resin (I) and the water-insoluble resin powder (II) is from 2:98 to 98:2.

4,528,319

SAG CONTROL OF HIGH SOLID POLYURETHANE CLEARCOATS BY UREA THIXOTROPE/SILICA SYSTEMS

Robert A. Ottaviani, Washington; William T. Short, Southfield, and Donald J. Hart, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1984, Ser. No. 633,055

Int. Cl.³ C08K *3/36*

U.S. Cl. 524—540 **3 Claims**

1. A sprayable high solids urethane clearcoat composition comprising a urethane binder resin, a partially methylolated melamine cross-linking agent, and a flow control system consisting of a urethane-urea polymer and silica particles, said flow control system being added in an amount between 7 to 15 weight percent of said composition to improve the flow properties of the urethane clearcoat, said urethane-urea polymer constituent being a reaction product of an isocyanate-terminated polyether urethane prepolymer and an ethanolamine selected from the group consisting of monoethanolamine, diethanolamine, and triethanolamine.

4,528,320

LOW TEMPERATURE, MOISTURE CURE COATING COMPOSITION

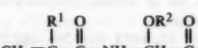
David A. Ley, Stamford, Conn., and Susan M. Cady, Yardley, Pa., assignors to American Cyanamid Co., Stamford, Conn.

Filed Sep. 6, 1983, Ser. No. 529,236

Int. Cl.[3] **C08J** *39/00;* **C08K** *39/00*

U.S. Cl. 524—555 **10 Claims**

1. A low temperature, moisture cure coating composition comprising (a) a crosslinkable, solvent borne, solution polymer containing from about 1 to 100 weight percent of repeating units derived from an activated ester-containing vinyl monomer of the formula



wherein the R^1 group is selected from H and CH_3, and the R^2 and R^3 groups are independently selected from alkyls of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxyalkyls of 2–6 carbon atoms; with any balance of repeating units derived from one or more copolymerizable ethylenically unsaturated comonomers; and (b) a ketimine made from a ketimine-forming ketone and a crosslinking agent having a plurality of primary amine groups, each capable when in the free amine form of replacing the OR^3 moiety by nucleophilic substitution, the ketimine being present in an amount sufficient to produce a crosslinked polymer when said primary amine groups are in said free amine form.

4,528,321

POLYMER DISPERSIONS AND THEIR PREPARATION

Adrian S. Allen, North Yorkshire, and Peter Flesher, West Yorkshire, both of England, assignors to Allied Colloids Limited, Bradford, England

Filed Mar. 30, 1984, Ser. No. 595,137

Claims priority, application United Kingdom, Apr. 6, 1983, 8309275

Int. Cl.[3] **C08K** *5/05, 5/06;* **C08L** *33/00, 35/00*

U.S. Cl. 524—761 **17 Claims**

1. A reverse phase polymerization process for making a dispersion in water immiscible liquid of water soluble or water swellable polymer and comprising dispersing an aqueous solution of polymerizable monomer in water immiscible liquid in the presence of a dispersing system comprising a polymerization stabilizer and polymerizing the monomer, and in which the dispersing system includes at least one non-ionic compound selected from C_{6-12} alkanols, C_{4-12} alkylene glycol monoethers and their C_{1-4} alkanoates, C_{6-12} polyalkylene glycol monoethers and their C_{1-4} alkanoates and benzyl alcohol.

4,528,322

AQUEOUS CATIONIC DISPERSIONS OF SYNTHETIC POLYMERS

Frederic Leising, Vaujours, France, assignor to Rhone-Poulenc Specialites Chimiques, France

Filed Jan. 25, 1984, Ser. No. 573,723

Claims priority, application France, Jan. 28, 1983, 83 01301

Int. Cl.[3] **C08K** *5/16*

U.S. Cl. 524—829 **46 Claims**

1. Aqueous cationic dispersion of synthetic polymers obtained by reacting:

(a) at least one unsaturated tertiary nitrogen compound not capable of being hydrolyzed in an acid or alkaline medium, with

(b) a cationic aqueous emulsion reaction mixture, containing:

(i) at least one non-ionic monomer capable of being copolymerized with said unsaturated nitrogen compound to form synthetic polymers,

(ii) at least one unsaturated salt of a polycoordinated onium of a Group 5a or 6a element capable of copolymerizing with said monomers,

(iii) a cationic or non-ionic polymerization initiator, and

(iv) a cationic or non-ionic emulsifier.

4,528,323

PROCESS FOR THE PREPARATION OF AQUEOUS DISPERSIONS OF POLYURETHANES CONTAINING CHEMICALLY FIXED CARBOXYLATE AND/OR SULPHONATE GROUPS

Otto Lorenz, and Gerd Rose, both of Aachen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,329

Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216567

Int. Cl.[3] **C08L** *75/04, 75/12;* **C08G** *18/10*

U.S. Cl. 524—839 **11 Claims**

5. A process for the preparation of aqueous dispersions of polyurethanes containing chemically fixed carboxylate and/or sulphonate groups which comprises

(a) preparing an isocyanate prepolymer having a monomeric diisocyanate content of at least 1.4% by weight,

(b) reducing the monomeric diisocyanate content to less than 1.2% by weight

(c) reacting the isocyanate prepolymer obtained in (b) with an organic diaminocarboxylate and/or an organic diaminosulfonate and optionally other chain lengthening agents which have amino groups and which are free from salt groups

in the aqueous or aqueous/organic phase, using an equivalent ratio of isocyanate groups to amino groups in the range of from about 1:1.2 to 1:0.05, optionally with the addition of further quantities of water, the nature and quantitative proportions of the reactants being chosen so that the resulting polyurethane has a carboxylate and/or sulphonate group content of from about 2 to 80 milliequivalents per 100 g of polyurethane solids.

4,528,324

PROCESS FOR PRODUCING RTV SILICONE RUBBER COMPOSITIONS USING A DEVOLATILIZING EXTRUDER

Rack H. Chung, Clifton Park; Gary M. Lucas, Scotia, and August O. Liermann, Schenectady, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 437,895, Nov. 1, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,405

Int. Cl.[3] **C08L** *83/04*

U.S. Cl. 524—863 **57 Claims**

1. A continuous process for preparing a stable, one package, substantially anhydrous, room temperature vulcanizable organopolysiloxane composition, stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer, comprising passing through a devolatilizing extruder:

(a) an organopolysiloxane wherein the silicon atom at each polymer chain end is hydroxy terminated;

(b) a polyalkoxy crosslinking agent; and

(c) an end-capping catalyst system which is a mixture of an acidifying agent and an amine where the acidifying agent is a Lewis acid and wherein the amine is selected from primary, secondary and tertiary amines;

so as to produce polyalkoxy-terminated organopolysiloxanes wherein when a condensation catalyst is mixed in the polyalkoxy-terminated organopolysiloxane there is formed an RTV composition.

4,528,325
COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Jun. 3, 1983, Ser. No. 500,785
Int. Cl.³ C08F 32/00
U.S. Cl. 525—60 **11 Claims**

1. A non-crosslinked poly(vinyl alcohol) copolymer which is the reaction product of:

a. a non-crosslinked poly(vinyl trifluoroacetate) copolymer having a molecular weight in the range of 200,000 to 4,000,000 which is the reaction product of:

1. 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and
2. 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes; and

b. a mild base in a non-aqueous diluent selected so that the poly(vinyl trifluoroacetate) copolymer and its poly(vinyl alcohol) copolymer solvolysis product are insoluble therein,

said poly(vinyl alcohol) copolymer being a hydrogel capable of absorbing water in the range of 10 to 95 weight percent without dissolving therein, and having a tensile strength of at least 6.9 kg/cm^2.

8. A process for preparing a poly(vinyl alcohol) copolymer comprising the steps:

a. admixing

(1) 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and
(2) 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes,

b. allowing said admixture to react so as to form a poly(vinyl trifluoroacetate) copolymer having a molecular weight in the range of 200,000 to 4,000,000, and

c. solvolyzing said poly(vinyl trifluoroacetate) copolymer in a mild base in a non-aqueous diluent so as to produce said poly(vinyl alcohol) copolymer, said base in a non-aqueous diluent being selected so that the poly(vinyl trifluoroacetate) copolymer and the copolymeric poly(vinyl alcohol) solvolysis product are insoluble therein,

said poly(vinyl alcohol) copolymer being a hydrogel capable of absorbing water in the range of 10 to 95 weight percent without dissolving therein, and having a tensile strength of at least 6.9 kg/cm^2.

9. The process according to claim 8 wherein said base is selected from ammonium hydroxide and organic amines.

4,528,326
POLYAMIDE-IMPACT MODIFIED STYRENIC POLYBLENDS

Barry D. Dean, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 30, 1983, Ser. No. 509,544
Int. Cl.³ C08L 75/00, 51/00
U.S. Cl. 525—66 **14 Claims**

1. A polyblend consisting essentially of from about 35 to about 70 weight percent of a polyamide resin having seven or more methylene units separating each amide bond and from about 65 to about 30 weight percent of an impact modified styrenic/α,βunsaturated dicarboxylic anhydride or its imide derivative copolymer resin, wherein the copolymer resin is modified by conducting the polymerization of the copolymer in the presence of a rubber material and a thermoplastic elastomer, wherein said rubber material is a polymer having a glass transition temperature of less than or equal to −40° C., with 70 to 100 percent by weight of the polymer being recurring units of at least one monomer selected from the group consisting of butadiene, ethylene, propylene and nonconjugated dienes and 30 to 0 percent by weight of the polymer being recurring units of at least one monomer selected from the group consisting of styrene and acrylonitrile, and wherein said thermoplastic elastomer is a polymer having a glass transition temperature of greater than or equal to −25° C., with 5 to 35 percent by weight of said polymer being recurring units of butadiene and 65 to 95 percent by weight of said polymer being comprised of recurring units of at least one monomer selected from the group consisting of styrene and methylmethacrylate.

4,528,327
COMPOSITION OF POLYPHENYLENE ETHERS WITH CORE-SHELL RUBBER-MODIFIED POLYSTYRENE

Glenn D. Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 353,498, Mar. 1, 1982, abandoned, which is a continuation of Ser. No. 220,165, Dec. 23, 1980, abandoned. This application Nov. 1, 1982, Ser. No. 438,024
Int. Cl.³ C08G 61/10; C08K 3/32
U.S. Cl. 525—68 **21 Claims**

1. A thermoplastic composition comprising:

(a) a polyphenylene ether resin; and

(b) a rubber-modified polystyrene which comprises a continuous polystyrene phase containing dispersed rubbery particles, the majority of said particles consisting of a core of polystyrene in a shell of diene rubber membrane, said rubbery particles constituting at least 30 percent of the total volume of the rubber-modified polystyrene and having an average size ranging from about 0.2 to about 0.4 microns.

4,528,328
BLENDS OF VINYL HALIDE-POLYOLEFIN GRAFT POLYMERS AND ASA POLYMERS

Gautam R. Ranade, Grand Island, and Gideon Salee, Williamsville, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,228
Int. Cl.³ C08L 51/04, 51/06
U.S. Cl. 525—71 **13 Claims**

1. A polymer composition comprising a high impact vinyl halide polymer which is a vinyl halide-hydrocarbon polyolefin graft copolymer; and a polymer of a vinyl aromatic compound, an unsaturated nitrile and a base polymer selected from the group consisting of chlorinated polyethylene and an acrylic polymer which comprises a polymer of (1) at least one alkyl acrylate, (2) at least one vinyl or vinylidene compound polymerizable with (1), and (3) a polyallyl compound.

4,528,329

PRODUCTION OF POLYOLEFIN COPOLYMER

Hiroshi Inoue; Tadashi Sezume; Masaaki Isoi; Kunio Iwanami, all of Saitama, and Kazuo Sei, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,640

Claims priority, application Japan, May 17, 1982, 57-81472

Int. Cl.[3] C08L *51/00*

U.S. Cl. 525—74 22 Claims

1. The reaction product which comprises:

a modified polyolefin consisting essentially of a polyolefin having grafted thereon an unsaturated carboxylic acid or anhydride thereof; and

from 5 to 200 parts by weight of a polar vinyl polymerized copolymer having epoxy groups and a molecular weight of between 5,000 and 1,000,000 per 100 parts of the modified polyolefin.

4,528,330

RESIN COMPOSITION USABLE WITHOUT BEING COATED

Kazuo Kishida, Ohtake; Akira Hasegawa, Hiroshima; Yasunori Kawachi, Ohtake; Hiroshi Kawasaki, and Hiroshi Mizukoshi, both of Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 284,668, Jul. 20, 1981,. This application Nov. 1, 1982, Ser. No. 438,264

Claims priority, application Japan, Aug. 13, 1980, 55-111181

Int. Cl.[3] C08L *51/06*

U.S. Cl. 525—85 16 Claims

1. A method of manufacturing articles, which are not coated with a protective coating, for exterior use having good impact resistance, excellent color tone and weatherability characteristics, comprising:

molding a graft copolymer composition into a desired shape, said graft copolymer composition comprising (I) 10 to 70% by weight of a high-rubber-content graft polymer obtained by polymerizing 50 to 10% by weight of a monomer mixture (C) comprising 10 to 90% by weight of at least one aromatic vinyl monomer and 90 to 10% by weight of at least one ethylenically unsaturated monomer represented by the following formula:

$CH_2{=}CRX$

wherein R is hydrogen or methyl, and X is —CN or $—COOR_1$ in which R_1 is an alkyl group having 1 to 8 carbon atoms, in the presence of a latex of multi-layer crosslinked arylic rubber particles containing 5 to 30% by weight of a rigid crosslinked resin (A) having a core particle size of 0.30 to 0.40μ in the interior of the rubber particles and 45 to 85% by weight of a crosslinked acrylic acid ester polymer (B) comprising an acrylic acid ester as the main component in the outer layer of the rubber particles, so that the total amount of the components (A), (B) and (C) is 100% by weight, (II) 90 to 30% by weight of a thermoplastic resin obtained by polymerizing at least one alkyl acrylate or methacrylate represented by the following formula:

$CH_2{=}CRCOOR_1$

wherein R is hydrogen or methyl, and R_1 is alkyl of 1 to 8 carbon atoms, in an amount of at least 90% by weight, and (III) 0 to 50% by weight of a diene type rubber-containing thermoplastic resin, the sum of the amounts of the components (I), (II) and (III) being 100% by weight.

4,528,331

SEALANT COMPOSITIONS HAVING, AS AN ESSENTIAL COMPONENT, HYDROGENATED POLYBUTADIENE AS NETWORK POLYMER

Georg G. A. Böhm, Akron; Mario DeTrano, Massillon, and James E. Hall, Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 261,426, May 7, 1981, Pat. No. 4,445,562. This application Apr. 26, 1984, Ser. No. 604,290

Int. Cl.[3] C08F *136/06*

U.S. Cl. 525—313 9 Claims

1. A sealant composition containing conventional additives and, as essential rubber components, a fully compatible blend of (1) a high molecular weight, hydrogenated polybutadiene homopolymer having a molecular weight of between 80,000 and 400,000, a vinyl content prior to hydrogenation of between 10 and 98% and a level of hydrogenation of between 40 and 98%; and (2) a low molecular weight liquid elastomer, said hydrogenated polymer providing a crosslinked network in said elastomer wherein the ratio of the polybutadiene (1) to elastomer (2) is 10-30 to 90-70.

4,528,332

EPOXY COMPOUNDS, PROCESS FOR THE PREPARATION THEREOF AND RESIST MATERIALS COMPRISING THEREOF

Hideo Ai; Akihiko Ikeda, and Yoshio Matsuoka, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

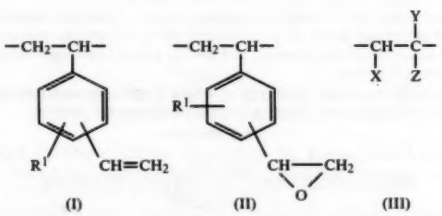
Filed Jan. 3, 1984, Ser. No. 567,481

Claims priority, application Japan, Jan. 6, 1983, 58-255; Mar. 3, 1983, 58-33818

Int. Cl.[3] C08F *8/08*

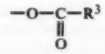
U.S. Cl. 525—332.2 20 Claims

1. A copolymer having a weight average molecular weight of 500 to 5,000,000 and comprising 2 to 60% by weight of a recurring unit represented by the formula (I), 10 to 70% by weight of a recurring unit represented by the formula (II) and 10 to 90% by weight of a recurring unit represented by the formula (III):



(I) (II) (III)

wherein R^1 is a hydrogen atom or a methyl group; X is a hydrogen atom, a methyl group or a phenyl group; Y is a hydrogen atom, a halogen atom, a methyl group, a phenyl group or a cyano group; and Z is a phenyl group, a phenyl group substituted by at least one alkyl group having 1 to 8 carbon atoms, a polycyclic aromatic hydrocarbon group having 10 to 20 carbon atoms, a cyano group, $—COOR^2$ (in which R^2 is an alkyl group having 1 to 20 carbon atoms or an aromatic hydrocarbon group having 6 to 14 carbon atoms), $—COR^3$ (in which R^3 is an alkyl group having 1 to 12 carbon atoms or an aromatic hydrocarbon group having 6 to 14 carbon atoms), a nitro group, a pyridyl group,



(in which R^3 has the same meaning as defined above), or a halogen atom.

4,528,333

CURABLE, IMINATED RESINS FROM AMINOPLASTS AND HYDROXYL-CONTAINING CARBOXYLIC ACIDS

Wen-Hsuan Chang, and Robert Piccirilli, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1984, Ser. No. 594,185
Int. Cl.[3] C08G *6/00;* C08L *61/02, 67/00*
U.S. Cl. 525—398 19 Claims

1. An ungelled synthetic resin which is a reaction product of components comprising: an aminoplast resin, a hydroxyl-containing carboxylic acid, and an alkylenimine.

4,528,334

CARBOXYLATED POLY(OXYALKYLENES)

Robert J. Knopf, St. Albans, and Kenneth Drake, Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 307,229, Sep. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 234,094, Feb. 12, 1981, abandoned, which is a continuation of Ser. No. 963,408, Nov. 24, 1978, abandoned. This application Apr. 30, 1984, Ser. No. 605,559
Int. Cl.[3] C08F *283/06*
U.S. Cl. 525—404 11 Claims

1. A method for preparing graft copolymers of acrylic acid and a poly(oxyalkylene) which comprises adding in separate feed streams from about 3 percent to 15 percent by weight, based on the total weight of poly(oxyalkylene) charged, of acrylic acid and a catalytic amount of t-butyl perbenzoate, di-t-butyl peroxide or t-butyl hydroperoxide to an agitated bath of poly(oxyalkylene) whereby all of said components are intimately admixed at a temperature of about 100° C. to about 160° C. and maintaining said temperature until a graft copolymer of acrylic acid on said poly(oxyalkylene) is obtained which is substantially free of insoluble homopolymerized acrylic acid, said poly(oxyalkylene) having the formula:

$$R''[(OC_nH_{2n})_zOR']_a$$

wherein R'' is a hydrocarbon radical containing up to 10 carbons which is free of aliphatic unsaturation and has a valence of a, a is an integer having a value of 1 to 4, R' is a hydrogen atom or a monovalent hydrocarbon radical containing up to 6 carbons which is free of aliphatic unsaturation, n has a value of 2 to 4, inclusive, and z is an integer having a value of about 8 to about 800.

4,528,335

POLYMER BLENDS

Larry M. Selby, and William H. Beever, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1984, Ser. No. 611,784
Int. Cl.[3] C08F *283/04*
U.S. Cl. 525—420 18 Claims

1. A composition comprising:
(a) poly(arylene sulfide), and
(b) about 0.1 to about 100 parts by weight of an amorphous polyamide per 100 parts poly(arylene sulfide); wherein said amorphous polyamide has less than about 20% crystallinity.

4,528,336

METHOD FOR PREVENTING POLYMER SCALE DEPOSITION IN POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Shunichi Koyanagi, Kanagawa; Hajime Kitamura; Toshihide Shimizu, both of Chiba, and Ichiro Kaneko, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,040
Claims priority, application Japan, Mar. 23, 1981, 56-42020
Int. Cl.[3] C08F *2/20*
U.S. Cl. 526—62 5 Claims

1. A method, in the polymerization of an ethylenically unsaturated polymerizable monomer in an aqueous medium contained in a polymerization reactor, for preventing deposition of polymer scale on the surfaces of the inner walls of the polymerization reactor and other parts coming into contact with the monomer during the polymerization which comprises, prior to the polymerization, providing a coating layer on the surface formed of a condensation product prepared by the condensation reaction of at least one aromatic amine compound selected from the class consisting of aniline, 1,2- 1,3- and 1,4-phenylenediamines, 2-, 3- and 4-aminophenols, 4-aminodiphenylamine and 4,4'-diaminodiphenylamine, and at least one aromatic nitro compound selected from the class consisting of nitrobenzene, 2-, 3- and 4-nitrophenols, 2-, 3- and 4-nitrobenzoic acids and 2-, 3- and 4-nitrobenzenesulfonic acids, in the presence of a mineral acid and a condensation catalyst at a temperature in the range from 100° to 250° C., wherein the amount of the aromatic nitro compound in the condensation reaction is in the range from 0.10 to 0.50 mole per mole of the aromatic amine compound.

4,528,337

PROCESS AND APPARATUS FOR MANUFACTURING VINYL CHLORIDE POLYMERS

Kurt Kreilein; Hans Geschonke, both of Pulheim; Wolfgang Rummel, and Hardo Wiemer, both of Cologne, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 487,607, Apr. 22, 1983, abandoned. This application Apr. 26, 1984, Ser. No. 604,082
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215624
Int. Cl.[3] C08F *2/16*
U.S. Cl. 526—70 9 Claims

1. A process for the manufacture of vinyl chloride polymer or copolymer by microsuspension polymerization of vinyl chloride or vinyl chloride and up to 30% by weight, based on the total monomer content, of α-olefinically unsaturated monomers copolymerizable with vinyl chloride comprising the steps of:
(1) dispersing the monomer or the monomer mixture in water in the presence of from 0.1 to 3% by weight, based on the total weight of the monomer content, of microsuspension dispersion auxiliaries selected from the group consisting of emulsifiers, protective colloids and polymers containing carboxyl groups and from 0.001 to 3% by weight, based on the total weight of the monomer content, of microsuspension monomer-soluble radical-initiators;
(2) homogenizing said dispersion so that monomer droplets mostly having a mean diameter of from 0.1 to 3 μm are obtained,
(3) polymerizing said homogenized dispersion in a vertically elongated reactor area at a preselected elevated temperature and elevated pressure, while
(4) maintaining an inert gas cushion over said aqueous polymerization mixture in said reactor area;
(5) during said polymerization withdrawing gas from said inert gas cushion and, inserting an inert gas only slightly soluble in the reaction mixture and containing less than 1% by weight of vinyl chloride into said aqueous polymerization mixture at the lower part of said vertically

elongated reactor area in the form of small bubbles, so that the partial pressure in the reactor of the said inert gas is from 0.5 to 10 bar and the volume of the gas inserted is, under the reaction conditions, from 1 to 100% of the volume of said vertically elongated reaction area per hour, the pressure in the reactor held constant and the same amount of gas blown into the autoclave is released; and

(6) recovering said vinyl chloride polymer or copolymer, wherein no mechanical agitation of the dispersion takes place during polymerization.

4,528,338

POLYMERIZATION PROCESS USING CHROMIUM CATALYST ON MIXED METAL PHOSPHATE WITH ORGANOBORON COCATALYSTS

Max P. McDaniel, and Marvin M. Johnson, both c/o French & Doescher, P.O. Box 2443, Bartlesville, Okla. 74005

Division of Ser. No. 461,318, Jan. 27, 1983, Pat. No. 4,481,302. This application Jul. 27, 1984, Ser. No. 635,081

Int. Cl.³ C08F *4/06, 4/72*

U.S. Cl. 526—113 **21 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule with a catalyst system comprising:

(a) a catalyst comprising a chromium component on a xerogel base comprising 75–99 mole percent aluminum phosphate and 1 to 25 mole percent of a phosphate of at least one other metal selected from gallium, yttrium, zirconium, lanthanum, neodymium and thorium; and

(b) an organoboron cocatalyst.

4,528,339

POLYMERIZATION OF OLEFINS EMPLOYING CATALYSTS PREPARED FROM NOVEL TITANIUM COMPOUNDS

William M. Coleman, III, Lake Jackson, and Morris S. Edmondson, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1983, Ser. No. 566,107

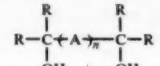
Int. Cl.³ C08F *4/44, 110/02*

U.S. Cl. 526—127 **24 Claims**

1. In a process for polymerizing at least one α-olefin or a mixture of at least one α-olefin and at least one polymerizable ethylenically unsaturated monomer in the presence of a supported Ziegler-Natta catalyst; the improvement which comprises employing as the transition metal component of such catalyst that which results from reacting

(A) at least one titanium compound represented by the formula $Ti(OR)_xX_{4-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen and x has a value from zero to 4; with

(B) at least one compound containing at least one aliphatic hydroxyl group represented by the formula



I.

wherein A is a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each R is independently hydrogen, a hydrocarbyl group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyl group, each such hydrocarbyl or hydrocarbyloxy groups having from 1 to about 20 carbon atoms; n is zero or 1; and wherein components (A) and (B) are employed in quantities which provide a molar ratio of (B):(A) of 0.1:1 to about 10:1.

4,528,340

PROCESS FOR PRODUCING HYDROPHILIC POLYMERS

Osamu Hayashi, Chiba; Hideo Kurihara, and Yukio Matsumoto, both of Ichihara, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Aug. 29, 1984, Ser. No. 645,501

Int. Cl.³ C08F *8/32*

U.S. Cl. 525—379 **17 Claims**

1. A process for producing a hydrophilic polymer, comprising the step of:

epoxidizing a diene polymer material consisting of at least one member selected from the group consisting of rubber polymers which have a molecular weight of 10,000 or more and contain a 1,4-addition structure in a molar content of 85% or more based on the entire molar amount of double bonds contained therein, and crystalline 1,2-polybutadiene polymers which have a melting point of from 60° C. to 170° C., and a reduced Viscosity (ηsp/c) of 0.2 or more determined in a tetrahydronaphthalene solution in a concentration of 200 mg/100 ml at a temperature of 100° C., and contain a 1,2-addition structure in a molar content of 75% or more based on the entire molar amount of double bonds contained therein, to an extent such that the degree of epoxidization of said rubber polymers is in the range of from 5% to 60% and the degree of epoxidization of said crystalline 1,2-polybutadiene is in the range of from 5% to 45%; and

ring-opening at least a portion of the epoxy rings in the resultant epoxidized polymeric material by heating it in the presence of a tertiary amine and a carboxylic acid.

4,528,341

POLYESTER AND ITS USE IN POWDER COATING

Eimbert G. Belder; Robert van der Linde, and Jan Schippers, all of Zwolle, Netherlands, assignors to DSM Resins B.V., Zwolle, Netherlands

Division of Ser. No. 478,546, Mar. 24, 1983, Pat. No. 4,471,108. This application Aug. 8, 1984, Ser. No. 638,429

Claims priority, application Netherlands, Oct. 29, 1982, 8204205

Int. Cl.³ C08F *283/00, 283/02;* C08G *63/76*

U.S. Cl. 525—438 **17 Claims**

1. A powder coating wherein the binding agent is composed of a homogeneous mixture of a tri-epoxy compound and a polyester containing carboxyl groups, wherein said mixture contains between 1.4 and 5.3 wt. % of a tri-epoxy compound, and from 94.7 to 98.6 wt. % of a polyester of an aromatic dicarboxylic acid and an aliphatic diol having the following combination of properties: (a) an acid number between 10 and 26 mg KOH/g, (b) a hydroxyl number that is smaller than 15 mg KOH/g, (c) a theoretical number-average molecular weight between 4,500 and 12,500 and (d) a glass transition temperature between 40° and 85° C.

4,528,342

EPOXY RESIN COMPOSITIONS

Douglas Wilson, Godalming, England, assignor to The British Petroleum Company p.l.c., London, England

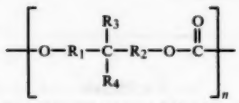
Filed Sep. 11, 1984, Ser. No. 649,285

Claims priority, application United Kingdom, Sep. 16, 1983, 8324911

Int. Cl.³ C08G *63/00, 69/00*

U.S. Cl. 525—463 **13 Claims**

1. A hardened epoxy resin composition comprising a curable epoxy resin, a hardener for the epoxy resin and a polymer of epihalohydrin characterised in that the amount of the polymer of epihalohydrin in the composition is from 1 to 6 parts by weight per one hundred parts by weight of the epoxy resin and in that the composition also comprises from 2 to 25 parts by weight per hundred parts by weight of the epoxy resin, of a polycarbonate having the general formula;



where

R_1 and R_2 are the same or different and are phenyl or cyclohexyl groups,

R_3 and R_4 are the same or different and are hydrogen, methyl or cyclohexyl groups and

n is from 60 to 400 and represents the average number of monomer units in the polymer chain.

4,528,343

ANTITHROMBOGENIC ELASTOMER, MOLDED PRODUCTS OF THE SAME, AND A PROCESS FOR MANUFACTURING THE SAME

Kazuaki Kira, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 384,210, Jun. 2, 1982, abandoned. This application May 7, 1984, Ser. No. 606,559

Claims priority, application Japan, Jun. 22, 1981, 56/97270; Apr. 27, 1982, 57/72298

Int. Cl.³ C08G *18/48, 18/61*

U.S. Cl. 528—26 **14 Claims**

1. An antithrombogenic elastomer for medical use comprising thermoplastic polyurethane or polyurethane urea containing 4 to 15 weight percent of polysiloxane having a molecular weight of 500 to 10,000 in the main chain, and containing a polyether or a polyester having a molecular weight of 500 to 6,000 as a soft segment other than said polysiloxane.

4,528,344

LOW MOLECULAR WEIGHT RESINS FROM NONAROMATIC POLYOLS AND AMINOPLASTS

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 21, 1984, Ser. No. 612,507

Int. Cl.³ C08L *61/28*

U.S. Cl. 525—509 **18 Claims**

1. An ungelled, crosslinkable, hydroxyl group-containing resin having a weight average molecular weight of less than 4500 which is a reaction product of components comprising:

(A) a nonaromatic polyol having a molecular weight of less than 230, and

(B) an aminoplast.

4,528,345

WEATHER-RESISTANT EPOXY COATINGS

Harold G. Waddill, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,342

Int. Cl.³ C08G *59/50, 59/56;* C08L *63/00*

U.S. Cl. 525—523 **4 Claims**

1. A method for making weather-resistant epoxy coatings comprising

(a) reacting aminoethylpiperazine with a cycloaliphatic diepoxy resin at room temperature to about 150° C. wherein the amount of aminoethylpiperazine reacted is the amount which will ensure a maximum level of primary amine reaction but give a reaction product which is not too viscous to handle and then

(b) combining the reaction product of (a) with a curing amount of polyoxyalkylene polyamine and an accelerator which contributes little or no yellowing during the weathering process.

4,528,346

RESIN COMPOSITION

Toshinori Sugie; Ryoichi Ishikawa, both of Takaishi, and Fumihiro Kobata, Izumi, all of Japan, assignors to Dainippun Ink and Chemicals, Inc., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,697

Claims priority, application Japan, Sep. 17, 1982, 57-160872; Sep. 18, 1982, 57-162977; Sep. 28, 1982, 57-167685; Oct. 5, 1982, 57-175210; Mar. 10, 1983, 58-38277

Int. Cl.³ C08F *283/00*

U.S. Cl. 525—523 **7 Claims**

1. A resin composition comprising (A) a polyphenylene sulfide, (B) an epoxy compound, (C) a thermoplastic resin other than (A) and having a melt viscosity of at least 1,000 poises at a temperature in the range of from 230° to 370° C. and (D) optionally a filler.

4,528,347

PROCESS FOR PRODUCING POLYMERS OF MONOALLYLAMINE

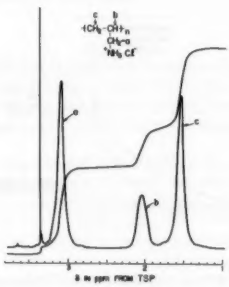
Susumu Harada, and Kiyoshi Shimizu, both of Koriyama, Japan, assignors to 501 Nitto Boseki, Co. Ltd, Fukushima, Japan

Filed Nov. 7, 1984, Ser. No. 669,463

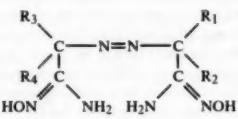
Claims priority, application Japan, Nov. 10, 1983, 58-211511; Mar. 14, 1984, 59-48444

Int. Cl.³ C08F *4/04*

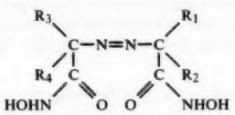
U.S. Cl. 526—219 **17 Claims**



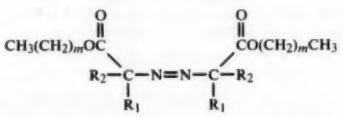
1. A process for producing a polymer of monoallylamine or a salt thereof which comprises polymerizing an inorganic acid salt of monoallylamine in a polar solvent in the presence of an azo type initiator selected from azo compounds represented by formulae (I), (II), (V) and (VI):



[I]



[II]



[V]

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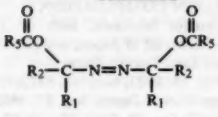


[VI]

wherein R_1, R_2, R_3 and R_4 each represents, which may be the same or different, a hydrocarbon group; R_1 and R_2 or/and R_3 and R_4 may be combined to complete a ring together with the carbon atom attached thereto; R_5 represents a hydrogen atom or an alkyl group; and m represents 0 or 1.

4,528,348

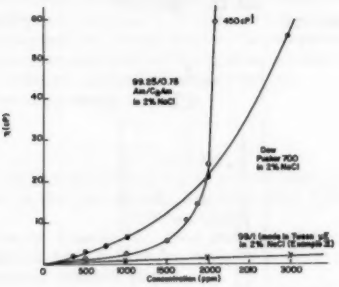
MICELLAR PROCESS FOR THE PRODUCTION OF ACRYLAMIDE-ALKYL ACRYLAMIDE COPOLYMERS

S. Richard Turner, Rochester, N.Y.; Donald B. Siano, Fanwood, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 454,289, Dec. 29, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 527,108

Int. Cl.³ C08F *2/26, 2/28, 2/30*

U.S. Cl. 526—225 **7 Claims**



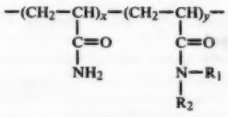
1. A homogeneous micellar free radical copolymerization process for the formation of a copolymer of acrylamide and an alkyl acrylamide corresponding to the formula below which comprises the steps of:

(a) forming a mixture of sodium dodecyl sulfate or other suitable surfactant, acrylamide monomer and alkyl acrylamide monomer under a nitrogen atmosphere;

(b) adding deoxygenated water to said mixture to form a homogeneous reaction solution;

(c) adding a free radical initiator to said homogeneous reaction solution to initiate polymerization of said acrylamide monomer and said alkyl acrylamide monomer; and

(d) copolymerizing said acrylamide monomer and said alkyl acrylamide monomer at a sufficient temperature and for a sufficient period of time to form said copolymer of acrylamide/alkyl acrylamide and without the formation of substantial amounts of particulates or phase separation occurring, said copolymer having an intrinsic viscosity of about 1 to about 10 dl/g, said copolymer having the formula:



wherein R_1 is a C_6 to C_{22} alkyl or cycloalkyl group, R_2 is the same or different alkyl group as R_1 or hydrogen, x is about 90.0 to about 99.9 mole %, and y is about 0.1 to about 10.0 mole %.

4,528,349

POLYMERIZATION PRODUCTS OF VINYLACETYLENE-TERMINATED POLYIMIDE DERIVATIVES

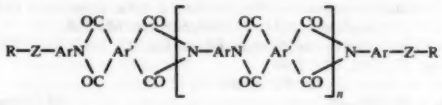
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 353,871, Mar. 2, 1982, Pat. No. 4,435,323, which is a continuation-in-part of Ser. No. 199,616, Oct. 22, 1980, abandoned. This application Dec. 12, 1983, Ser. No. 560,591

Int. Cl.³ C08F *22/40*

U.S. Cl. 526—262 **22 Claims**

1. An addition polymerization product of the enyne-terminated polyimide of the formula:



wherein:

Ar′ is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms of said aromatic radical and each pair of carbonyl groups being attached to adjacent carbon atoms in Ar′ except that in the case of Ar′ being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic radical;

n is an integer having a value of one to 20;

R is hydrogen or an organic moiety containing one to 21 carbon atoms; and

Z is the structure —CH=CH—C≡C— or —C≡C—CH=CH—, the addition polymerization being effected by reaction between the respective R—Z— groups.

4,528,350

POLYMERS OF α,β-UNSATURATED N-SUBSTITUTED CARBOXYLIC ACID AMIDES

Bernhard Goossens, Velbert; Erich Küster, Krefeld; Kurt Dahmen, Monchen-Gladbach, and Eduard Barthell, Krefeld, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Krefeld, Fed. Rep. of Germany

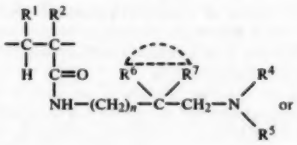
Division of Ser. No. 107,245, Dec. 26, 1979, Pat. No. 4,408,073. This application Jul. 11, 1983, Ser. No. 512,496

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856383; Mar. 24, 1979, 2911642

Int. Cl.³ C08F *20/60*

U.S. Cl. 526—307 **8 Claims**

1. A polymer containing repeating units of the formula



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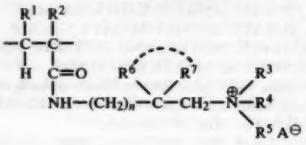


in which

R^1 and R^2 each independently is hydrogen or methyl,

R^6 and R^7 each independently is alkyl having 1 to 4 carbon atoms or aryl, or together form an aliphatic ring,

n is a number from 0 to 10,

R^4 and R^5 each independently is alkyl having 1 to 4 carbon atoms, or cycloalkyl having 3 to 8 carbon atoms,

R^3 is hydrogen or alkyl with 1 to 4 carbon atoms, and

A is a salt-forming anion.

4,528,351

PLASTIC LENS

Niro Tarumi, Akishima; Yoichi Okubo, and Seiichi Yoshimoto, both of Fussa, all of Japan, assignors to Hoya Lens Corporation, Itsukaichjimachi, Japan

Filed Jul. 22, 1982, Ser. No. 400,750

Claims priority, application Japan, Jul. 30, 1981, 56-119760

Int. Cl.³ C08F *220/20*; G03B *1/00*

U.S. Cl. 526—314 **3 Claims**

1. A plastic lens having a stepped segment composed of a copolymer obtained by copolymerizing diethylene glycol bisallyl carbonate, at least one monomer selected from the group A shown below and at least one monomer selected from the group B shown below, said materials being used in such proportions that diethylene glycol bisallyl carbonate will be 95–50% by weight, the group A monomer will be 5–50% by weight based on the total weight of the diethylene glycol bisallyl carbonate and Group A monomer and the group B monomer will be 0.1–25% by weight based on the total weight of said diethylene glycol bisallyl carbonate and group A monomer,

Group A: methyl acrylate, ethyl acrylate, cyclohexyl acrylate, glycidyl acrylate, allyl acrylate or their methacrylate versions,

Group B: diethylene glycol diacrylate, triethylene glycol diacrylate, tetraethylene glycol diacrylate or their methacrylate versions.

4,528,352

RTV SILICON COMPOSITIONS AND PROCESSES

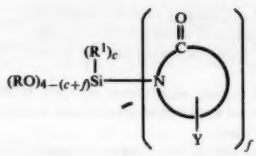
Rack H. Chung, deceased, late of Clifton Park, N.Y. (by Betsy A. Chung, executrix), assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 338,518, Jan. 11, 1982, Pat. No. 4,424,157. This application Dec. 2, 1983, Ser. No. 542,842

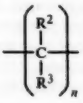
Int. Cl.³ C08G *77/06*

U.S. Cl. 528—18 **36 Claims**

1. A stable, one-package, substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane compositions stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer comprising: (1) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least 2 alkoxy radicals; (2) an effective amount of a condensation catalyst; (3) a stabilizing amount of silane scavenger for hydroxy functional groups having the formula



where R is a $C_{(1-8)}$ aliphatic organic radical selected from the group consisting of alkyl, alkylester, alkylketone and alkylcyano radicals, or a $C_{(7-13)}$ aralkyl radical, R^1 is a $C_{(1-13)}$ monovalent substituted or unsubstituted hydrocarbon radical, Y is a



radical, where R^2 and R^3 are selected from the group consisting of hydrogen, a $C_{(1-12)}$ alkyl, alkenyl, alkylester, alkylether, aryl, alkaryl and a aralkyl radical, n is a whole number that varies from 2 to 4 and 6, 7, 8, c is a whole number equal to 0 to 3 inclusive, f is an integer equal to 1 to 4 inclusive and the sum of c+f is equal to 1 to 4 inclusive.

4,528,353

ADHESION PROMOTERS FOR ONE-COMPONENT RTV SILICONE COMPOSITIONS

Gary M. Lucas, Scotia, and John J. Dziark, Ballston Spa, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 349,538, Feb. 17, 1982, Pat. No. 4,483,973. This application Jun. 22, 1984, Ser. No. 623,743

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—21 **10 Claims**

1. A method of making a one-package and substantially acid-free room temperature vulcanizable composition curable to the solid elastomeric state, which method comprises agitating under substantially anhydrous conditions at a temperature in the range of from 0° C. to 180° C., a room temperature vulcanizable material selected from

(i) a mixture comprising

(a) 100 parts of a silanol-terminated polydiorganosiloxane,

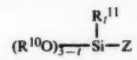
(b) a stabilizing amount of a scavenger for hydroxy functional groups,

(c) 0–10 parts of a polyalkoxy crosslinking agent,

(d) an effective amount of a condensation catalyst,

(e) 0–5 parts of a curing accelerator selected from the group consisting of substituted guanidines, amines and mixtures thereof, and

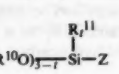
(f) an effective amount of an adhesion promoter having the formula



where R^{10} and R^{11} are C_{1-8} monovalent hydrocarbon radicals, t varies from 0 to 3 and Z is a saturated, unsaturated or aromatic hydrocarbon radical, said hydrocarbon radical further functionalized by a member selected from the group consisting of amino, ether, epoxy, isocyanato, cyano, isocyanurate, acryloxy and acyloxy and mixtures thereof; and

(ii) a mixture comprising

(a) 100 parts of a polyalkoxy-terminated polydiorganosiloxane,
(b) 0–10 parts of a polyalkoxy crosslinking agent,
(c) an effective amount of condensation catalyst,
(d) a stabilizing amount of scavenger for hydroxy functional groups,
(e) 0–5 parts of a curing accelerator selected from the group consisting of substituted guanidines, amines and mixtures thereof, and
(f) an effective amount of an adhesion promoter having the formula



where R^{10} and R^{11} are C_{1-8} monovalent hydrocarbon radicals, t varies from 0 to 3, and Z is a saturated, unsaturated, or aromatic hydrocarbon radical further functionalized by a member selected from the group consisting of amino, ether, epoxy, isocyanato, cyano, isocyanurate, acryloxy and acyloxy and mixtures thereof.

4,528,354

PROCESS AND COMPOSITION FOR THE MANUFACTURE OF PRODUCTS FROM SILICONE RUBBER

John R. McDougal, 7043 Strout Rd., Morrow, Ohio 45152

Filed Apr. 25, 1984, Ser. No. 603,765
Int. Cl.³ C08G *77/04*
U.S. Cl. 528—33 **9 Claims**

1. A process for the manufacture of a molded silicone rubber product comprising the steps of:
(a) forming a substantially uniform mixture comprising room temperature vulcanizing or heat curing silicone rubber components and a liquid phase including an organic peroxide cross-linking agent encapsulated within an encapsulating material to form microcapsules, the microcapsules being impervious to the cross-linking agent and having a wall thickness and a rupture strength designed to withstand external agitation, but to rupture when the internal vapor pressure reaches a rupture point;
(b) maintaining substantially all of said cross-linking agent in the microcapsules isolated from said silicone rubber components until the temperature and pressure are such that the cross-linking agent is released from the microcapsules;
(c) performing a molding cycle having a first and second portion,
(i) the first portion being a flowing step comprising flowing the mixture to fill a mold cavity with the mixture prior to any significant cross-linking agent induced cross-linking,
(ii) the second portion being a cross-linking step comprising raising the temperature of the mixture within the mold cavity to raise the vapor pressure within the microcapsules to the rupture point to cause the microcapsules to rupture, and to release the organic peroxide cross-linking agent, substantially all cross-linking occurring during the second portion of the molding cycle; and
(d) removing the cured mixture from the mold cavity to provide the silicone rubber product.

4,528,355

POWDER VARNISHES BASED ON PARTIALLY BLOCKED ISOPHORONE DIISOCYANATE ISOCYANURATE AND HYDROXYL GROUP CONTAINING POLYESTER, AND METHOD FOR PRODUCING MATTE COATINGS

Rainer Gras, Bochum, and Heinz Riemer, Bottrop, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,986
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328131
Int. Cl.³ C08G *18/80*
U.S. Cl. 528—45 **14 Claims**

1. A powder coating composition exhibiting good storage stability, having a particle size less than 100 microns and yielding a matte surface after hardening at a temperature of 170° to 220° C., comprising:
a mixture of at least one hydroxyl group containing polyester, at least one isophorone diisocyanate isocyanurate partially blocked with ϵ-caprolactam having a melting point above 130° C. and a free NCO content between 2 to 8 wt. % and additives.

4,528,356

PROCESS FOR PREPARING HIGHER MOLECULAR WEIGHT EPOXY RESINS

Roy A. Allen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 26, 1984, Ser. No. 634,831
Int. Cl.³ C08G *59/06, 59/16*
U.S. Cl. 528—89 **6 Claims**

1. A process for preparing higher molecular weight polyepoxides from lower molecular weight polyepoxides which comprises reacting (1) a lower molecular weight epoxy resin having at least one vicinal epoxy group per molecule, (2) a polyhydric compound, (3) an etherification catalyst and (4) dimethylol propionic acid.

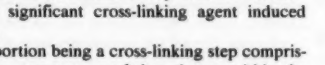
4,528,357

CURABLE MIXTURES CONTAINING HYDROXYALKYL-CYANOACETATES, AND THE USE THEREOF FOR PRODUCING CURED PRODUCTS

Alfred Renner, Muntelier, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,761
Claims priority, application Switzerland, Aug. 5, 1983, 4267/83
Int. Cl.³ C08G *59/62*
U.S. Cl. 528—93 **11 Claims**

1. A curable mixture containing
(a) an epoxide resin having on average more than one epoxy group in the molecule, and
(b) as curing agent for the epoxide resin, a compound of the formula I



(I)

wherein
m and n independently of one another are an integer from 1 to 5, and
m and n together are at most 6, and
R is a radical of the valency m derived from an alcohol having at most 6 hydroxyl groups, which radical can be interrupted by oxygen atoms and has a molecular weight not exceeding 200.

4,528,358

METHOD FOR THE MANUFACTURE OF EPOXY RESIN MOLDING MATERIALS

Wolfgang Kleeberg, Erlangen; Klaus-Robert Hauschildt; Heinz Hacker, both of Nuremberg, and Klaus Kretzschmar, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

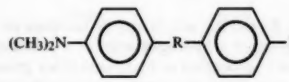
Filed Jul. 30, 1984, Ser. No. 635,423

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327712

Int. Cl.³ C08G *59/68*

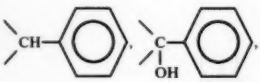
U.S. Cl. 528—94 **16 Claims**

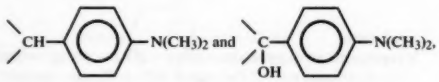
1. A method for the manufacture of molding materials from polymerisable di- or poly-epoxy compounds comprising laminates, stratified materials and covers or protective layers comprising mixing epoxy resin components and; catalyzing the polymerization of epoxy resin components with mixed catalysts comprising a tertiary amine of the formula:



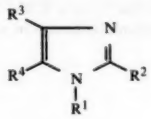
where R has the following meaning:

$>CH_2$, $>CHOH$, $>CO$, $>CS$, $-O-$, $-S-$, $>SO_2$,





and an imidazole of the formula:



where

R^1=—H, $—CH_3$, $—(CH_2)_2—CN$, $—CH=CH_2$, $—(CH_2)_3—NH_2$ or $—C_6H_5$,

R^2=—H, $—CH_3$, $—C_2H_5$, $—CH(CH_3)_2$ or $—C_6H_5$,

R^3=—H or $—CH_3$ and

R^4=—H or $—CH_3$

whereby R^1, R^2, R^3 and R^4 are not at the same time —H and R^1 and R^2 are not at the same time $—C_6H_5$.

4,528,359

ADDUCTS OF EPOXY RESINS AND AMINO-SUBSTITUTED AROMATIC SULFONIC ACID AMIDES

Jody R. Berman; James L. Bertram, both of Lake Jackson, and Ross C. Whiteside, Jr., Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 16, 1984, Ser. No. 610,896

Int. Cl.³ C08G *59/54, 59/44*

U.S. Cl. 528—109 **32 Claims**

1. A resin composition resulting from heating, at a temperature sufficient to cause primarily a reaction between the epoxy groups and the primary aromatic amine groups, but insufficient to cause a significant reaction between the amide groups for a time sufficient to complete the reaction between the aromatic amine groups and the epoxy groups, a composition comprising (A) at least one epoxy resin having an average of more than one 1,2-epoxy group per molecule and (B) at least one amine substituted aromatic sulfonic acid amide; wherein components (A) and (B) are employed in quantities which provide at least about 0.2 1,2-epoxy group for each primary aromatic amine group.

4,528,360

WATER-SOLUBLE FILM OR SHEET

Takeshi Fujita; Shigeo Mori, both of Kyoto; Hironori Kataoka, Yamatokoriyama, and Akira Taniuchi, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 476,155, Mar. 17, 1983,. This application Sep. 17, 1984, Ser. No. 651,486

Claims priority, application Japan, Mar. 17, 1982, 57-43340; Apr. 13, 1982, 57-62164

Int. Cl.³ C08G *63/42, 63/66, 59/00*

U.S. Cl. 528—297 **4 Claims**

1. A water-soluble film or sheet comprising a polyoxyalkylene compound having an average molecular weight of at least 50,000 and being prepared by chemically linking molecules of a polyhydroxyl compound with each other through an esterifying agent selected from the group consisting of a polycarboxylic acid, an anhydride thereof and a lower alkyl ester thereof, said polyhydroxyl compound having an average molecular weight of at least 3,000 and a content of oxyethylene units of at least 70% by weight.

4,528,361

COPOLYMERS OF HYDROXYMETHYLBENZOIC ACID AND LACTAM

David P. Sinclair, Winfield, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 19, 1983, Ser. No. 563,114

Int. Cl.³ C08G *69/14*

U.S. Cl. 528—323 **7 Claims**

1. A composition comprising a thermoplastic resin from (1) lactam and (2) a compound selected from the group consisting of p-hydroxymethylbenzoic acid, m-hydroxymethylbenzoic acid and mixtures thereof in ratios of 1:20 to 20:1.

4,528,362

METHOD FOR PRODUCING SPINNABLE POLYAMIDE FROM DINITRILE WITH PHOSPHORUS ESTER CATALYST

Hansdieter Hofmann, Karben; Hans-Jochen Rothe, Maintal; Georg Skupin, Bruchkobel, and Konrad Wolff, Frankfurt am Main, Fed. Rep. of Germany, assignors to Davy McKee, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 375,971, May 10, 1982, Pat. No. 4,436,898, which is a continuation-in-part of Ser. No. 370,271, Apr. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 264,982, May 18, 1981, abandoned. This application Jan. 17, 1984, Ser. No. 571,598

Int. Cl.³ C08G *69/28*

U.S. Cl. 528—336 **6 Claims**

1. A method for the production of a spinnable polyamide comprising contacting a dinitrile, an aliphatic diamine, excess water and a catalytic amount of a phosphorus ester compound in a reaction vessel, said phosphorus compound being taken from the group consisting of the alkyl, aryl and alkyl/aryl esters of

(a) phosphorous

(b) phosphonic

(c) alkyl, aryl and alkyl/aryl substituted phosphonic

(d) hypophosphorous

(e) alkyl, aryl and alkyl/aryl substituted phospinic, and

(f) phosphoric acids.

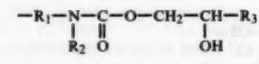
4,528,363

HEAT-CURABLE RESIN COATING COMPOSITION

Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Feb. 22, 1984, Ser. No. 582,595
Claims priority, application Japan, Feb. 23, 1983, 58-27747
Int. Cl.³ C08G *59/56;* C09D *5/44*
U.S. Cl. 528—370 **16 Claims**

1. A heat-curable resin coating composition comprising as a resin binder a film-forming resin which contains at least two tertiary nitrogen atoms per molecule and may optionally contain primary or secondary amino groups, each of said tertiary nitrogen atoms having directly bonded thereto a functional group represented by the following formula



(I)

wherein R_1 represents a divalent saturated aliphatic hydrocarbon group having 1 to 18 carbon atoms which may be substituted by a hydroxyl group and/or may be interrupted by an ether linkage (—O—); R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 6 carbon atoms, or a part of the main chain of the resin; and R_3 represents a hydrogen atom or a hydrocarbon group having 1 to 12 carbon atoms which may be substituted by a hydroxyl group and/or may be interrupted by an ether linkage, and each of said tertiary nitrogen atoms optionally forming a member of a nitrogen-containing heterocyclic ring formed together with R_1 and R_2 in the above formula and the nitrogen atom to which they are bonded.

4,528,364

REMOVAL OF ALKALINE CATALYSTS FROM POLYETHER POLYOLS AND POLYALKYLENE CARBONATE POLYOLS

Donald G. Prier, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 19, 1984, Ser. No. 601,877
Int. Cl.³ C07C *41/34*
U.S. Cl. 528—370 **11 Claims**

1. A method of removing alkaline catalysts from polyether polyols and polyalkylene carbonate polyols which comprises

(a) dissolving a polyether polyol or a polyalkylene carbonate polyol in a polar aprotic solvent;

(b) contacting the polyether polyol or polyalkylene carbonate polyol solution with a sufficient amount of an adsorbent which adsorbs alkaline catalysts to adsorb the alkaline catalysts, at a temperature of between about −30° C. and 110° C. under conditions such that the adsorbent adsorbs the alkaline catalysts; and

(c) physically separating the adsorbent from the polyol solution.

4,528,365

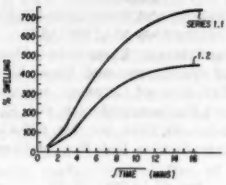
HYDROGELS

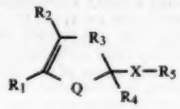
Neil B. Graham, Bearsden, Scotland, assignor to National Research Development Corporation, London, England

Division of Ser. No. 387,817, Jun. 14, 1982, Pat. No. 4,438,258. This application Jan. 9, 1984, Ser. No. 569,263
Claims priority, application United Kingdom, Jun. 12, 1981, 8118088; Jun. 12, 1981, 8118089; Jun. 12, 1981, 8110890
Int. Cl.³ C08G *67/02*
U.S. Cl. 528—392 **4 Claims**

1. A hydrogel, which comprises: polymerized moieties derivable from

(i) at least one polymerizable cyclic (thio) ether of the formula:





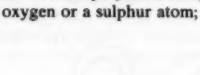
wherein R_1, R_2 and R_4, which may be the same or different, each represent a hydrogen atom or a substituted or unsubstituted hydrocarbyl or hydrocarbyloxy group;

R_3 represents a substituted or unsubstituted methylene, ethylene or 1,3-propylene group;

R_5 represents a monovalent polymerisable group;

Q represents an oxygen or a sulphur atom; and

Y represents:



wherein

Y represents an oxygen atom or an $—NR_6—$ group, wherein R_6 represents any of the values which R_1 may assume;

a is 0 or 1;

b is 0 or 1;

c is 0 or 1;

with the proviso that b+c is 1, and

(ii) at least one hydrophilic homo- or copolymer.

4,528,366

PRODUCTION OF POLYTRIAZINES FROM AROMATIC POLYCYANATES WITH COBALT SALT OF A CARBOXYLIC ACID AS CATALYST

Edmund P. Woo, Midland, and David V. Dellar, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 425,358, Sep. 28, 1982, abandoned. This application Feb. 15, 1984, Ser. No. 580,406
Int. Cl.³ C08G *73/06*
U.S. Cl. 528—422 **15 Claims**

1. A process for the preparation of a polytriazine consisting essentially of contacting an aromatic polycyanate with a catalytic amount of a cobalt salt of a C_{6-20} carboxylic acid at a temperature between about 20° C. and about 200° C. wherein the aromatic polycyanate corresponds to the formula $Ar—OCN)_n$ wherein Ar represents an aromatic radical or an aromatic radical interrupted by one or more bridge members and n is a number of from 1 to 7.

4,528,367

METHOD AND INTERMEDIATES FOR PREPARING HIGH PURITY 3,3'-AZO-BIS-(6-HYDROXY BENZOIC ACID)

Karl H. Agback, Upsala, and Alf S. Nygren, Örbyhus, both of Sweden, assignors to Pharmacia AB, Upsala, Sweden

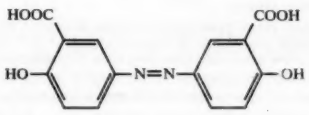
Continuation of Ser. No. 247,402, Mar. 25, 1981, abandoned. This application Jan. 31, 1983, Ser. No. 462,356

Claims priority, application Sweden, Mar. 26, 1980, 8002321

Int. Cl.[3] **C07C** *107/06;* **C09B** *29/01, 29/14, 43/00*

U.S. Cl. 534—599 **16 Claims**

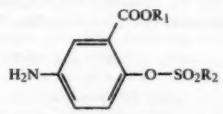
1. A method of preparing 3,3'-azo-bis-(6-hydroxy benzoic acid) of formula I



I

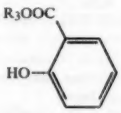
or salts thereof, comprising the steps of:

diazotizing a compound of formula II or a salt thereof



II

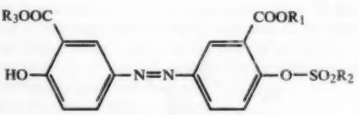
wherein R_1 is lower alkyl and R_2 is lower alkyl, phenyl or alkyl substituted phenyl, coupling the diazonium salt obtained in alkaline aqueous solution to a compound of formula III



III

wherein R_3 is hydrogen or lower alkyl,

to form a compound of formula IV



IV

wherein R_1, R_2 and R_3 are as indicated above,

and hydrolizing in alkaline medium the compound of formula IV, and isolating the compound of formula I or a salt thereof.

16. 3,3'-azo-bis-(6-hydroxy benzoic acid) or salts thereof of at least 98% purity pharmaceutically acceptable purity.

4,528,368

AZO DYES FROM 2-AMINO-5-CYANOMETHYLTHIO-1,3,4-THIADIAZOLE AND ANILINE AND TETRAHYDROQUINOLINE COUPLERS

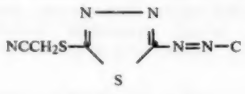
Max A. Weaver, and Clarence A. Coates, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 531,188, Sep. 12, 1983, abandoned, which is a continuation of Ser. No. 315,107, Oct. 26, 1981, abandoned. This application May 3, 1984, Ser. No. 606,490

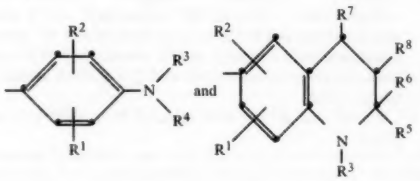
Int. Cl.[3] **C09B** *29/048, 29/09, 29/44;* **D06P** *1/18*

U.S. Cl. 534—768 **10 Claims**

1. A compound of the formula



wherein C is a coupling component selected from

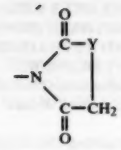


wherein

R^1 and R^2 are each selected from hydrogen, fluorine, chlorine, bromine, alkyl, cycloalkyl, alkoxy, phenoxy, alkylthio, arylthio, and radicals having the formula —NH—X—R^9 in which X is —CO— or —COO—, and R^9 is selected from alkyl, aryl, cycloalkyl and alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, and alkoxy, and when X is —CO—, R^9 is further selected from hydrogen, amino, alkenyl, alkylamino, dialkylamino, arylamino and furyl;

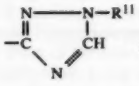
R^3 and R^4 are each selected from hydrogen; cycloalkyl; cycloalkyl substituted with one or two groups selected from alkyl, —OH, alkoxy, halogen and hydroxy substituted alkyl; phenyl or phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, cyano or alkoxycarbonyl; straight or branched alkenyl of 2–6 carbons; and straight or branched alkyl; or R^3 and R^4 combined forms pentamethylene, ethyleneoxyethylene or ethylenesulfonylethylene which, with the nitrogen atom to which it is attached, forms a ring;

wherein the alkyl groups of R^1, R^2, R^3 and R^4 are unsubstituted or substituted with 1–3 of the following: hydroxy; halogen; cyano; amino; alkoxy; alkoxyalkoxy; hydroxyalkoxy; succinimido; glutarimido; phenylcarbamoyloxy; phthalimidino; 2-pyrrolidono; cyclohexyl; phenoxy; phenyl or phenyl substituted with alkyl, alkoxy, alkoxycarbonyl, halogen, alkanoylamino or cyano; alkanoylamino; sulfamoyl; alkylsulfamoyl; acrylamido; phthalimido; benzoylsulfonicimido; alkylsulfonamido; phenylsulfonamido; alkoxycarbonylamino; alkylcarbamoyloxy; alkoxycarbonyl; alkoxycarbonyloxy; alkenylcarbonylamino; groups of the formula



wherein Y is —NH—,

—O—, —S—, >CHOH, or —CH_2O—; —S—R^{10} wherein R^{10} is alkyl, phenyl, phenyl substituted with halogen, alkyl, alkoxy, alkanoylamino, cyano or alkoxycarbonyl, pyridyl, pyrimidinyl, benzoxazolyl, benzimidazolyl, benzothiazolyl, or a radical of the formula



—SO_2R^9; —$COOR^9$; —OXR^9; —NH—X—R^9; —$CONR^{11}R^{11}$; —$SO_2NR^{11}R^{11}$; wherein R^9 and X are as defined above and R^{11} is selected from H and R^9; alkoxy substituted with hydroxy, cyano, alkanoyloxy or alkoxy; phenoxy; phenoxy substituted with 1–3 of alkyl, alkoxy or halogen; and

R^5, R^6, R^7, and R^8 are each selected from hydrogen and alkyl.

4,528,369

20-DIHYDRO-20-DEOXY-23-DE(MYCINOSYLOXY)-TYLOSIN

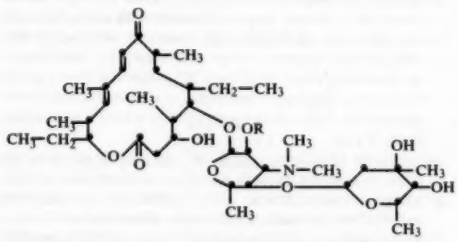
Gene M. Wild, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 394,599, Jul. 2, 1982, Pat. No. 4,423,148. This application Aug. 22, 1983, Ser. No. 525,064

Int. Cl.³ C07H *17/08;* **C12P** *19/62;* **A61K** *31/71*

U.S. Cl. 536—7.1 **11 Claims**

1. A compound of the formula



wherein R is hydrogen, C_1–C_5-alkanoyl, halo-substituted C_1–C_5-alkanoyl, benzoyl, phenylacetyl or phenylpropionyl, or benzoyl, phenylacetyl or phenylpropionyl substituted on the phenyl portion of the moiety by from one to five halo or methyl groups or by from one to two methoxyl, nitro or hydroxyl groups; and its acid addition salts.

4,528,370

POLYSUBSTITUTED 2-MORPHOLONES

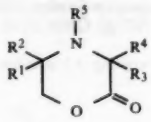
John T. Lai, 663 Tollis Pkwy., Broadview Heights, Ohio 44147

Filed Apr. 12, 1982, Ser. No. 367,631

Int. Cl.³ C07D *265/32*

U.S. Cl. 544—173 **2 Claims**

1. A polysubstituted 2-morpholine having the structure:



wherein,

R^1, R^2, R^3 and R^4 are independently alkyl having from 1 to about 24 carbon atoms;

R^5 is selected from hydrogen, oxygen, hydroxyl and alkyl having from 1 to about 24 carbon atoms.

4,528,371

PROCESS FOR PREPARING 6-(2-HYDROXYPHENYL)-3-PYRIDAZINONE

William J. Coates, and Brian H. Warrington, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Jun. 14, 1983, Ser. No. 504,204

Claims priority, application United Kingdom, Jun. 24, 1982, 8218373

Int. Cl.³ C07D *237/08;* **C07C** *59/48*

U.S. Cl. 544—239 **8 Claims**

1. A process for preparing 6-(2-hydroxyphenyl)-3-pyridazinone which comprises reacting 2-hydroxyacetophenone with glyoxylic acid under alkaline conditions, adjusting the pH of the reaction mixture to give a mixture within a pH range of about pH 4.0–9.5 and which contains a weak base, and subsequently reacting with hydrazine.

4,528,372

N-PHTHALIDYL-5-FLUOROURACILS

Kazuo Kigasawa; Mineharu Hiiragi; Kikuo Wakisaka; Keiko Ichikawa, all of Tokyo; Kikuo Nakazato, Kanagawa, and Taiji Okada, Hiroshima, all of Japan, assignors to Grelan Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP81/00260, § 371 Date May 21, 1982, § 102(e) Date May 21, 1982, PCT Pub. No. WO82/01370, PCT Pub. Date Apr. 29, 1982

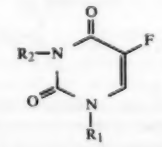
PCT Filed Sep. 30, 1981, Ser. No. 385,379

Claims priority, application Japan, Oct. 9, 1980, 55-140509

Int. Cl.³ C07D *405/04;* **A61K** *31/505*

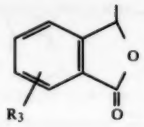
U.S. Cl. 544—310 **9 Claims**

1. A N-phthalidyl-5-fluorouracil compound represented by the formula (I):



(I)

wherein one of R_1 and R_2 represents the phthalidyl group:



wherein R_3 represents a hydrogen atom and the other of R_1 and R_2 represents a hydrogen atom, an acyl group or a cyclic ether group:

wherein n is 1 or 2, said acyl group being selected from the group consisting of a C_{1-6} alkanoyl group, a benzoyl group and a benzoyl group substituted on one position of the benzene ring with a substituent selected from the group consisting of a C_{1-6} alkyl group, a C_{1-6} alkoxyl group and a halogen atom; or R_1 and R_2 represent the same phthalidyl group heretofore defined wherein R_3 has the same meaning defined above.

4,528,373
VINYLACETYLENE-TERMINATED POLYIMIDE DERIVATIVES

Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 353,871, Mar. 2, 1982, Pat. No. 4,435,323, which is a continuation-in-part of Ser. No. 199,616, Oct. 22, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 565,289

Int. Cl.[3] **C07D** *209/34, 471/00;* **C08F** *22/40*

U.S. Cl. 546—66 **27 Claims**

1. The polyimide comprising the Diels-Alder addition product of (1) a conjugated enyne selected from the class consisting of

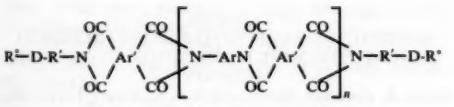
$C_6H_5—CH=CHC\equiv CC_6H_5$

$C_6H_5CH_2CH=CHC\equiv CCH_2C_6H_5$

$CH_3CH=CHC\equiv CCH_3$ and

$C_2H_5CH=CHC\equiv CC_2H_5$

with (2) an aromatic polyimide dienophile having the formula:



wherein:

Ar° is a monovalent aromatic radical;

Ar′ is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to the adjacent carbon atoms in Ar′ except in the case of Ar′ being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to pericarbon atoms;

Ar is a divalent aromatic radical;

D is a divalent dienophile group selected from the class consisting of —C(R)=CH— and a non-conjugated —C≡C—;

R is hydrogen or an organic moiety containing 1 to 21 carbon atoms;

R′ is a divalent hydrocarbon group of 1–12 carbon atoms;

R° is hydrogen or a hydrocarbon moiety containing one to 21 carbon atoms; and

n is zero or an integer having a value of one to 20, the addition being primarily between the unsaturated groups in said conjugated enyne and the unsaturation in the dienophile.

4,528,374
POLYALKYLPIPERIDINES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

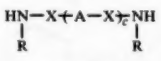
Division of Ser. No. 109,733, Jan. 4, 1980, Pat. No. 4,315,859. This application Nov. 9, 1981, Ser. No. 319,352

Claims priority, application Switzerland, Jan. 15, 1979, 357/79

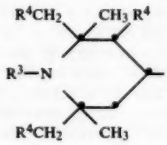
Int. Cl.[3] **C07D** *211/56, 401/12*

U.S. Cl. 546—186 **2 Claims**

1. A polyamine of the formula



wherein X is C_2–C_6alkylene; A is —O—, —S— or —NR—; each R independently is hydrogen, C_1–C_{23}alkyl, C_1–C_{23}alkyl having oxygen in the alkyl chain, C_3–C_{12}cycloalkyl, C_7–C_{18}aralkyl, C_6–C_{10}aryl or the radical of the formula II



(II)

wherein R^3 is hydrogen, C_1–C_{18}alkyl, C_3–C_{12}alkenyl, C_3–C_5alkynyl, C_3–C_{18}alkoxyalkyl, C_2–C_4hydroxyalkyl, C_2–C_4hydroxyalkyl substituted by phenyl or phenoxy, or C_7–C_{18}aralkyl, and R^4 is hydrogen or methyl; c is an integer from 1 to 4; and wherein at least one R is a radical of the formula II.

4,528,375
SUBSTITUTED 3,4-DIAMINO-1,2,5-THIADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

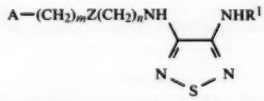
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 473,791, Mar. 16, 1983, , which is a continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,880

Int. Cl.[3] **C07D** *417/12, 417/14, 419/12, 419/14*

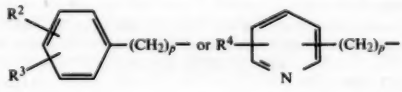
U.S. Cl. 546—193 **5 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



in which

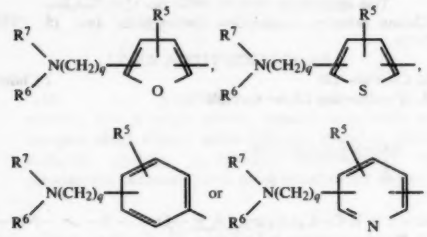
p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]-non-3-yl or 3pyrrolino; or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof.

5. The compound of claim 1 which is 3-amino-4-[3-(4-piperidinomethyl-2-pyridyloxy)propylamino]-1,2,5-thiadiazole, or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof.

4,528,376

3-(4-PIPERIDYL)-1,2-BENZISOXAZOLES

Joseph T. Strupczewski, Flemington, N.J.; Beth A. Gardner, San Jose, Calif., and Richard C. Allen, Flemington, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 407,235, Aug. 11, 1982, Pat. No. 4,408,054, which is a division of Ser. No. 319,871, Nov. 12, 1981, Pat. No. 4,355,037. This application May 9, 1983, Ser. No. 492,767

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.³ C07D *419/04*

U.S. Cl. 546—198 **1 Claim**

1. 3-(1-Formyl-4-piperidyl)-6-fluoro-1,2-benzisoxazole.

4,528,377

SUBSTITUTED 3,4-DIAMINO-1,2,5-THIADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

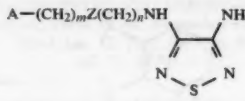
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Mar. 16, 1983, Ser. No. 473,791

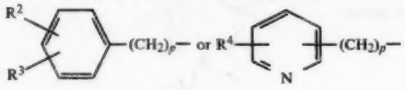
Int. Cl.³ C07D *417/10*

U.S. Cl. 546—209 **9 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



in which

p is 1 or 2,

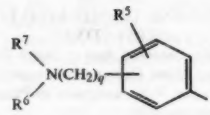
R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]-non-3-yl or 3-pyrrolino; or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof.

4,528,378

SUBSTITUTED 3,4-DIAMINO-1,2,5-THIADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

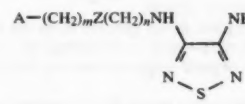
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 473,791, Mar. 16, 1983, , which is a continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,744

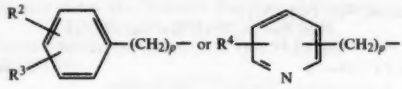
Int. Cl.³ C07D *417/14, 419/14, 417/12, 419/12*

U.S. Cl. 546—209 **6 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



in which

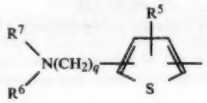
p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]non-3-yl or 3-pyrrolino; or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof.

6. The compound of claim 1 which is 3-amino-4-{2-[(5-piperidinomethyl-3-thienyl)methylthio]ethylamino}-1,2,5-thiadiazole, or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof.

4,528,379

PREPARATION OF SUBSTITUTED THIADIAZOLYLOXYACETAMIDES

Reimer Cölln, and Karl H. Mohrmann, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

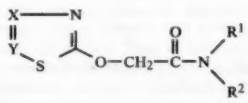
Filed Jul. 18, 1983, Ser. No. 515,084

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228132

Int. Cl.[3] **C07D** *417/12, 285/08, 285/12*

U.S. Cl. 546—209 **9 Claims**

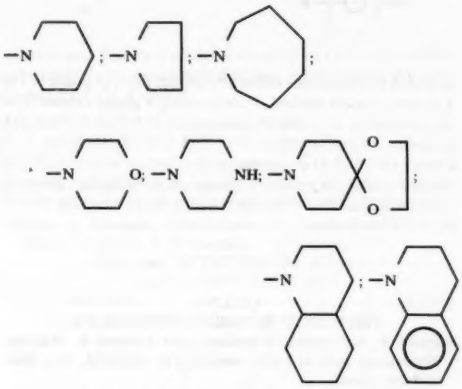
1. In a process for the preparation of a substituted thiadiazolyloxyacetamide of the formula



in which

R^1 and R^2 each independently is hydrogen, alkyl, alkenyl, alkenyl, alkinyl, optionally substituted cycloalkyl or cycloalkenyl, halogenoalkyl, alkoxyalkyl, alkoxy, aralkyl or optionally substituted aryl, or

R^1 and R^2, together with the nitrogen atom to which they are bonded, form a heterocyclic structure of the formula

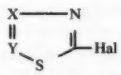


which is optionally substituted by alkyl having up to 6 carbon atoms, aryl having 6 to 10 carbon atoms and/or dioxyalkylene having 2 or 3 carbon atoms,

one of X and Y is a nitrogen atom and the other a C-R^3 a grouping, and

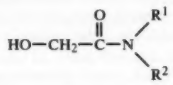
R^3 is alkyl, alkoxy, alkylthio, alkylsulphonyl, halogenoalkyl, aralkyl, aralkoxy, aralkythio or optionally substituted aryl,

wherein a substituted 5-halogenothiadiazole of the formula



in which Hal is halogen,

is reacted with a hydroxyacetamide of the formula



in the presence of a base as an acid acceptor and, optionally in the presence of a diluent, the improvement which comprises employing lithium hydroxide or its hydrate as the base, and carrying out the reaction at a temperature between about −10° C. and +60° C.

4. A process according to claim 1, wherein the 5-halogenothiadiazole is 2-trifluoromethyl-5-chloro-1,3,4-thiadiazole and the hydroxy acetamide is hydroxyacetic acid 2-ethylpiperidide.

4,528,380

5-(1-PROPYL)N-BUTYL TETRAZOLES

Alain P. Lacour, La Varenne; Michel Langlois, Buc; Maurice F. Jalfre, Maule, and Bernard P. Bucher, Marnes la Coquette, all of France, assignors to Delalande S.A., France

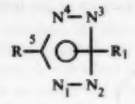
Filed Dec. 6, 1982, Ser. No. 446,971

Claims priority, application France, Dec. 7, 1981, 81 22864

Int. Cl.[3] **C07D** *257/04*

U.S. Cl. 548—250 **2 Claims**

1. A compound having the formula:



in which R_1 represents: either a hydrogen atom in position 1 or 2 of the tetrazole nucleus, R designating a group chosen from the following: (1,1-dimethyl)n-propyl; (1,1-dimethyl)n-butyl; (1-methyl 1-ethyl)n-pentyl; (1-propyl 1-meythyl)n-butyl; (1,1-dipropyl)n-butyl; (1-propyl)n-butyl; (2-propyl)n-pentyl; (1-isopropyl)n-butyl; (2-propen 1-yl)n-butyl; or a methyl group in position 2(3) of the tetrazole nucleus, R representing the (1-propyl)n-butyl chain.

4,528,381

PROCESS FOR MAKING TRIAZOLES

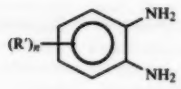
Richard A. Gencarelli, Waterbury, and Edward L. Wheeler, Watertown, both of Conn., assignors to Uniroyal, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 304,524, Sep. 21, 1981,. This application Aug. 26, 1982, Ser. No. 411,945

Int. Cl.³ C07D *249/18*

U.S. Cl. 548—257 **3 Claims**

1. A process for preparing and purifying aromatic triazoles comprising reacting a compound having the structural formula



(I)

with a compound having the formula R—O—NO (II) in a reaction medium consisting essentially of a C_6–C_{10} alkanol wherein n is zero, 1, or 2; R is C_6–C_{10} alkyl and R′ is hydrogen or C_1–C_{10} alkyl at a temperature of 90°–120° C., said process being conducted essentially in the absence of an acid catalyst, to form the product which is then extracted into aqueous caustic, optionally treated with decolorizing charcoal, then precipitated by neutralizing the caustic layer and separating the product.

4,528,382

IMIDOYL SUBSTITUTED PYRROLES

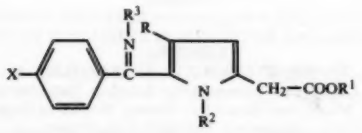
John E. Mills, Hatfield, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Nov. 16, 1982, Ser. No. 442,210

Int. Cl.³ C07D *207/337*

U.S. Cl. 548—561 **5 Claims**

1. An aryl-pyrrolyl-imine derivative compound having the formula



(I)

and the acid addition salts thereof, wherein X is H, NO_2, halo, lower alkyl, or lower alkoxy; R is H or methyl; R^1 is H or lower alkyl; R^2 is H or lower alkyl; and R^3 is C_{5-8} cyclic lower alkyl.

4,528,383

SUBSTITUTED CYCLIC AND HETEROCYCLIC METHANE SULFONATES

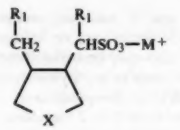
Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,553

Int. Cl.³ C07D *307/12, 333/18, 207/08*

U.S. Cl. 549—78 **3 Claims**

1. A compound according to the formula



wherein:

(i) X is selected from the group consisting of O and S;

(ii) R_1 is selected from the group consisting of hydrogen and unsubstituted C_1–C_3 alkyl; and

(iii) M is selected from the group consisting of Na, K, Li and NH_4.

4,528,384

ADDITION POLYMERIZABLE AROMATIC SULFONIUM SALTS AND POLYMERS THEREOF

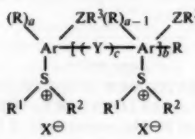
Donald L. Schmidt; Thomas C. Klingler, and Ritchie A. Wessling, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1980, Ser. No. 164,744

Int. Cl.³ C07D *333/16;* **B05D** *1/36*

U.S. Cl. 549—78 **5 Claims**

1. A water-soluble, addition polymerizable ethylenically unsaturated aromatic sulfonium salt represented by the formula:



I

wherein each Ar is individually a cyclic aromatic polyyl, each R is independently a suitably inert monovalent moiety capable of existing as a substituent on Ar, each R^1 and each R^2 are individually suitably inert monovalent organic moieties and/or each R^1 and R^2 are collectively a suitably inert divalent organic moiety which forms a heterocyclic ring with

each R^3 is individually an ethylenically unsaturated monovalent organic radical which is capable of undergoing addition polymerization, each Y is individually a suitably inert divalent radical capable of bridging aromatic moieties, each Z is individually a divalent sulfur or divalent oxygen, each $X^{\ominus}$ is a suitably inert anion, a is a positive number corresponding to the number of remaining available ring positions on Ar, b is 0, 1 or 2, and c is 0 or 1.

4,528,385

METHOD OF PREPARING PHTHALIDE

Helmut aus der Fünten, Niederkassel-Mondorf, and Wilhelm Vogt, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 459,018

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1982, 3201300

Int. Cl.³ C07D *307/88*

U.S. Cl. 549—307 12 Claims

1. In a method of preparing phthalide by the catalytic hydrogenation of phthalic acid anhydride using a nickel catalyst fixed on a support material, the improvement comprising:

hydrogenating the anhydride in a benzoic acid ester solvent with an alkanol added thereto and using a nickel catalyst having about 5% to 25% nickel content, said ester being an alkyl ester having up to 4 carbon atoms and having the same number of carbon atoms as the alkanol.

4,528,386

SYNTHESIS OF 2,4,8,10-TETROXASPIRO[5.5]UNDECANE

Algirdas C. Poshkus, Lancaster, Pa., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 54,502, Jul. 3, 1979, abandoned. This application Sep. 3, 1980, Ser. No. 183,707

Int. Cl.³ C07D *319/00*

U.S. Cl. 549—335 6 Claims

1. A process for the preparation of the cyclic diformal of pentaerythritol, which comprises providing a mixture of pentaerythritol and paraformaldehyde in approximately stoichiometric proportions, such mixture being substantially anhydrous and solvent-free, and heating such mixture in the presence of an acid catalyst to a temperature between about 105° and 150° C. thereby causing the mixture to liquify and continuing such heating for a total period of about 3 to 20 minutes to cause and complete the reaction of pentaerythritol with paraformaldehyde to produce the diformal of pentaerythritol, and during such heating allowing the water resulting from the reaction to evaporate.

4,528,387

SORBINIL BY OPTICAL RESOLUTION OF PRECURSOR 6-FLUORO-4-UREIDOCHROMAN-4-CARBOXYLIC ACID

Berkeley W. Cue, Jr., Gales Ferry, and Bernard S. Moore, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 440,641, Nov. 10, 1982, Pat. No. 4,435,578. This application Jan. 9, 1984, Ser. No. 569,117

Int. Cl.³ C07D *311/68*

U.S. Cl. 549—404 3 Claims

1. An amine salt with S-6-fluoro-4-ureidochroman-4-carboxylic acid wherein the amine is D-(+)-(1-phenethyl)amine or L-(−)-ephedrine.

4,528,388

XANTHOGEN DISULPHIDES

Günter Arend, Dormagen; Heinrich Königshofen, Bergisch-Gladbach; Peter Müller, Kerpen, and Rüdiger Musch, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

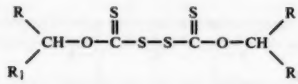
Filed Nov. 23, 1981, Ser. No. 323,993

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044811

Int. Cl.³ C07D *317/12*

U.S. Cl. 549—448 2 Claims

1. An xanthogen disulphide containing less than 1.7% by weight of elemental sulphur and of the formula:



wherein each R is hydrogen, C_1–C_6-alkyl or C_5–C_8-cycloalkyl and each R_1 is 1,3-dioxolan-5-yl or said radical mono- to trisubstituted by C_1 to C_4 alkyl.

4,528,389

PENTACOORDINATE SILYL ENOLATES AND THEIR USE AS POLYMERIZATION INITIATORS

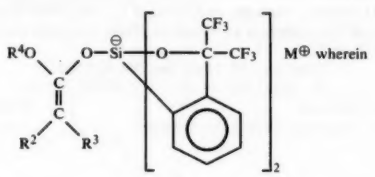
William B. Farnham, Wilmington, Del., assignor to E. I. Du Pont de Nemours And Company, Wilmington, Del.

Filed Jun. 12, 1984, Ser. No. 619,944

Int. Cl.³ C07F *7/08, 7/18*

U.S. Cl. 556—446 3 Claims

1. Pentacoordinate silyl enolate of the formula



wherein

each of R^2 and R^3 is independently selected from H or C_{1-5} alkyl; provided, however, both R^2 and R^3 are not H;

R^4 is a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms, optionally containing one or more ether oxygen atoms within aliphatic segments thereof; and

M is lithium, sodium, potassium or cesium.

4,528,390

PREPARATION OF POLYMETHYLSILSESQUIOXANE

Hiroshi Kimura, Ohta, Japan, assignor to Toshiba Silicone Co., Ltd., Gunma, Japan

Filed Jun. 21, 1984, Ser. No. 623,252

Claims priority, application Japan, Jul. 5, 1983, 58-122217

Int. Cl.³ C07F *7/08;* C08G *77/04, 77/16*

U.S. Cl. 556—450 4 Claims

1. A process for preparing polymethylsilsesquioxane comprising hydrolyzing and condensing methyltrialkoxysilane or its partially hydrolyzed condensate in an aqueous solution of ammonia or an amine.

4,528,391

PYRAZINO PYRAZINE COMPOUNDS AS CATALYSTS FOR PREPARING URETHANES

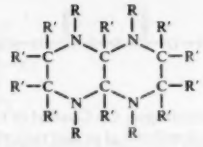
Duane S. Treybig, and James L. Potter, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 28, 1983, Ser. No. 555,761

Int. Cl.³ C07C *125/073*

U.S. Cl. 560—026 10 Claims

1. A process for preparing urethanes or thiourethanes which comprises reacting at least one material containing at least one hydroxyl group per molecule with at least one material containing at least one isocyanate or isothiocyanate group per molecule in the presence of a catalytic quantity of a pyrazino pyrazine compound represented by the formula



wherein each R is independently an alkyl group having from 1 to about 10, carbon atoms and each R′ is independently hydrogen or an alkyl group having from about 1 to about 10, carbon atoms, wherein said reaction is conducted at a temperature of about 0°–100° C. and said reaction is delayed.

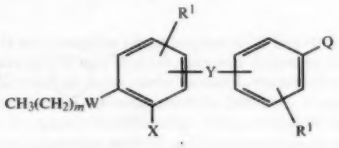
4,528,392

AROMATIC COMPOUNDS AS ANTIALLERGIC AGENTS

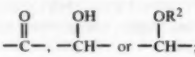
John H. Musser, Malvern, and Kenneth L. Kees, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 18, 1984, Ser. No. 601,521
Int. Cl.³ C07C *101/44, 83/10, 153/023, 153/03*
U.S. Cl. 560—43 **17 Claims**

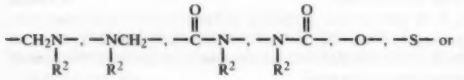
1. A compound having the formula

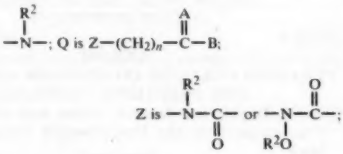


wherein
X is OR^2,SR^2,$N(R^2)_2$ or halo;
W is



Y is $-CH_2O-$, $-OCH_2-$, $-CH_2S-$, $-SCH_2-$,





m is 0–6;
n is 0–6;
p is 1–3;
A is O or S;
B is OR^2,SR^2 or $N(R^2)_2$;
R^1 is hydrogen, loweralkyl, loweralkoxy or halo;
R^2 is hydrogen or loweralkyl;
and the pharmaceutically acceptable salts thereof.

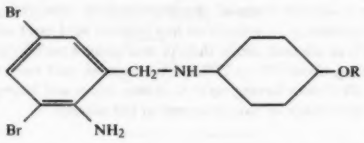
4,528,393

DERIVATIVES HAVING EXPECTORANT ACTIVITY, THE PROCEDURE FOR THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Adolfo Moroni, Brescia, Italy, assignor to Magis Farmaceutici S.R.L., Brescia, Italy

Filed Sep. 28, 1983, Ser. No. 536,737
Int. Cl.³ C07C *69/76*
U.S. Cl. 514—539 **21 Claims**

1. A compound having formula (I),



(I)

where R represents the groups: guaiacolglycolyl, (4-methylguaiacol)glycolyl, m-cresolglycolyl, o-cresolglycolyl, p-cresolglycolyl, thymolglycolyl, carvacrolglycolyl and guaiacolcarbonyl and pharmaceutically acceptable salts of the same compound.

4,528,394

PREPARATION OF HYDROXYAROMATIC ETHERS

Eric W. Otterbacher, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 3, 1983, Ser. No. 519,794
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—061 **20 Claims**

1. A process comprising contacting an acylaromatic ether with an oxidizing agent in the presence of a catalytic amount of an acid catalyst under reaction conditions such that the corresponding hydroxyaromatic ether is produced.

4,528,395

PROCESS FOR ESTERIFYING 3,5-DI-TERT-BUTYL-4-HYDROXYBENZOIC ACID

Richard F. Beidler, Marietta, Ohio, and Philip R. Ruby, Millington, N.J., assignors to American Cyanamid Co., Stamford, Conn.

Filed Aug. 15, 1983, Ser. No. 523,303
Int. Cl.³ C07C *69/88*
U.S. Cl. 560—067 **11 Claims**

1. In a process for making a C_8–C_{20} alkyl ester from 3,5-di-tert-butyl-4-hydroxybenzoic acid by reaction of 3,5-di-tert-butyl-4-hydroxybenzoic acid with a C_8–C_{20} alcohol at elevated temperature in the presence of a strongly acidic ion-exchange resin catalyst, the improvement comprising employing as said acidic ion-exchange resin catalyst from 5 to 20 percent by weight, based on the weight of the 3,5-di-tert-butyl-4-hydroxybenzoic acid, of a strongly acidic gel-type ion-exchange resin catalyst having less than about 8 percent cross-linking, and conducting the reaction of 3,5-di-tert-butyl-4-hydroxybenzoic acid with said C_8–C_{20} alcohol at 110° to 150° C.

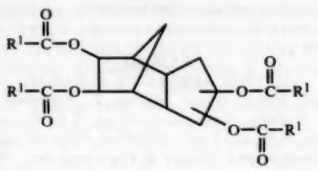
4,528,396

DICYCLOPENTADIENE DERIVED ESTER COMPOUNDS

John R. Sanderson, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,412
Int. Cl.³ C08K *5/12*
U.S. Cl. 560—256 **1 Claim**

1. Dicyclopentadiene derived ester compounds having the formula



where R^1 is a lower alkyl of 1 to 4 carbon atoms.

4,528,397

AMINOCARBOXYLIC ACID DERIVATIVES

Norio Shibamoto, Chigasaki; Takeo Yoshioka, Ayase; Yasuo Fukagawa, Kamakura, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

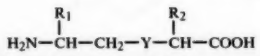
Filed Mar. 29, 1983, Ser. No. 479,982

Claims priority, application Japan, Mar. 30, 1982, 57-49950

Int. Cl.³ C07C *101/24*

U.S. Cl. 514—400 **10 Claims**

1. A compound represented by the formula



wherein R_1 and R_2 independently of each other represent a hydrogen atom or alkyl of up to 10 carbon atoms which is unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of cycloalkyl of up to 6 carbon atoms, phenyl, naphthyl, hydroxyphenyl, hydroxy, mercapto, lower alkyl mercapto, carboxy, amino, carbamoyl, guanidyl, pyrrolidinyl, imidazolyl and indolyl, and Y represents —NH— or —S—,

with the proviso that when Y represents —NH—, at least one of R_1 and R_2 represents an alkyl group which may be substituted, and with the further proviso that when Y represents —S—, at least one of R_1 and R_2 represents an alkyl group which may be substituted.

4,528,398

METHOD FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACID WITH HIGH ACTIVITY PHOSPHOMOLYBDIC ACID BASED CATALYSTS

James L. Callahan, Wooster; Wilfrid G. Shaw, and Arthur F. Miller, both of Lyndhurst, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Continuation of Ser. No. 271,458, Jun. 8, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,702

Int. Cl.³ C07C *51/235, 51/25, 57/05, 57/055*

U.S. Cl. 562—534 **13 Claims**

1. A process for the production of an unsaturated carboxylic acid by the oxidation of its corresponding saturated or unsaturated aldehyde with molecular oxygen in the vapor phase at a reaction temperature of about 200° C. to about 500° C. in the presence of a phosphomolybdic acid based catalyst prepared by:

forming a solution of hydrated phosphomolybdic acid in a substantially anhydrous alkanol having from 1 to 5 carbon atoms;

adding a base to said solution to bring the pH to about 2 to 6;

evaporating said solution to yield a catalyst powder; and

drying and calcining said powder to form the active catalyst.

8. A process for the preparation of an unsaturated carboxylic acid by the oxidation of its corresponding saturated or unsaturated aldehyde with molecular oxygen in the vapor phase at a reaction temperature of about 200° C. to about 500° C. in the presence of a phosphomolybdic acid based catalyst prepared by:

forming a solution of hydrated phosphomolybdic acid in a substantially anhydrous alkanol having from 1 to 5 carbon atoms;

evaporating said solution to form a concentrate;

impregnating a catalyst support material with said concentrate;

contacting said impregnated support with ammonia gas in an amount sufficient to form an insoluble precipitate of ammonium alkyl phosphomolybdic acid within the pore structure of said support material; and

drying and calcining said impregnated support material so as to form the final catalyst.

4,528,399

BENZO[B]THIOPHENES INTERMEDIATES

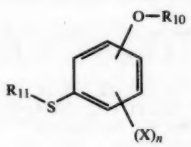
Helen H. Ong, Whippany, N.J., and James A. Profitt, Goshen, Ind., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 256,470, Apr. 4, 1981, Pat. No. 4,436,748, which is a continuation-in-part of Ser. No. 198,736, Oct. 20, 1980, abandoned. This application Dec. 5, 1983, Ser. No. 558,076

Int. Cl.³ C07C *149/32*

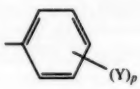
U.S. Cl. 568—43 **13 Claims**

1. A compound of the formula



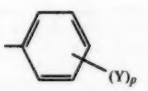
wherein R_{10} is lower alkyl; R_{11} is a group of the formula

group of the formula

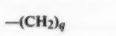


wherein Y is hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy and p is 1 or 2; R_{13} is or a group of the formula

wherein R_{14} is hydrogen, lower alkyl, lower cycloalkyl or a group of the formula



wherein Y and p are as above; R_{12} and R_{14} taken together form a group of the formula



wherein q is 3, 4, or 5; X is halogen; and n is 1 or 2, with the proviso that at least one of the two positions adjacent to the

sulfur group of the phenyl moiety substituted by O-R_{10} and X is not occupied by one of the substituents.

4,528,400

PREPARATION OF KETONES

Richard L. Cryberg, Chardon, and Russell M. Bimber, Painesville, both of Ohio, assignors to SDS Biotech Corporation, Painesville, Ohio

Continuation-in-part of Ser. No. 159,309, Jun. 9, 1980, abandoned, which is a continuation of Ser. No. 876,334, Feb. 9, 1978, abandoned, which is a continuation of Ser. No. 716,142, Aug. 20, 1976, abandoned. This application Nov. 20, 1981, Ser. No. 323,262

Int. Cl.³ C07C *45/48*

U.S. Cl. 568—314 **18 Claims**

1. A method for the production of product ketones comprising: introducing a reactant ketone and a carboxylic acid and/or carboxylic acid precursor into a chamber; passing the mixture of said reactant ketone and carboxylic acid and/or carboxylic acid precursor over a heated catalytically active metal oxide material; and recovering the product ketone.

4,528,401

CATALYTIC PROCESS FOR THE MANUFACTURE OF KETONES

Chuen Y. Yeh, Edison, and Charles Savini, Warren, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 420,715, Sep. 21, 1982, abandoned, and Ser. No. 420,627, Sep. 21, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,903

Int. Cl.³ C07C *45/42*

U.S. Cl. 568—408 **20 Claims**

1. An improved process for preparing ketones which comprises contacting an olefin in the gaseous phase in the substantial absence of free molecular oxygen in the presence of water vapor and in the additional presence of a molybdenum sulfides catalyst, prepared by the thermal decomposition of a thiomolybdate compound, under conditions sufficient to form the corresponding ketone from said olefin, said olefin comprising a member selected from the group consisting of linear mono-olefins of from 2 to 20 carbon atoms and cyclic monoolefins of from 3 to 20 carbon atoms, said thiomolybdate compound comprising at least one member selected from the group consisting of ammonium salts of molybdenum-sulfur cluster anions and compounds of the formula:

$$[R^1(R^2)N(R^3)R^4]_2MoO_xS_{4-x}$$

wherein R^1, R^2, R^3 and R^4 can be the same or different and are hydrogen, alkyl, aryl, alkaryl, aralkyl, cycloalkyl, substituted derivatives of the above groups and mixtures thereof, and x is 0, 1 or 2, and said thermal decomposition being conducted at a temperature of from about 150° to 600° C.

10. An improved process for preparing ketones which comprises contacting an olefin in the gaseous phase, in the substantial absence of H_2S, in the presence of water vapor and molecular oxygen and in the additional presence of a molybdenum sulfides catalyst, prepared by the thermal decomposition of a thiomolybdate compound, under conditions sufficient to form the corresponding ketone from said olefin, said olefin comprising a member selected from the group consisting of linear mono-olefins of from 2 to 20 carbon atoms and cyclic monoolefins of from 3 to 20 carbon atoms, said thiomolybdate compound comprising at least one member selected from the group consisting of ammonium salts of molybdenum-sulfur cluster anions and compounds of the formula:

$$[R^1(R^2)N(R^3)R^4]_2MoO_xS_{4-x}$$

wherein R^1, R^2, R^3 and R^4 can be the same or different and are hydrogen, alkyl, aryl, alkaryl, aralkyl, cycloalkyl, substituted derivatives of the above groups and mixtures thereof, and x is 0, 1 or 2, and said thermal decomposition being conducted at a temperature of from about 150° to 600° C.

4,528,402

HYDROCARBYLOXY ALKANAL

Richard M. Boden, Ocean; William L. Schreiber, Jackson; Futoshi Fujioka, Wanamassa, all of N.J.; Patrick Chant, Brooklyn, N.Y., and Lambert Dekker, Wyckoff, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

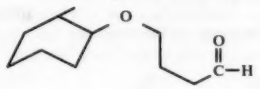
Division of Ser. No. 366,079, Apr. 6, 1982, Pat. No. 4,443,633. This application Sep. 26, 1983, Ser. No. 535,931

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.³ C07C *47/115*

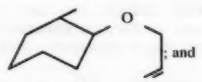
U.S. Cl. 568—445 **1 Claim**

1. A product containing norbornyl oxybutyraldehyde having the structure:



produced according to the process comprising the steps of:

(i) reacting allyl alcohol with camphene in order to form isobornyl allyl ether defined according to the structure:



; and

(ii) reacting the resulting isobornyl allyl ether with a mixture of carbon monoxide and hydrogen under superatmospheric pressure in the presence of an oxo reaction catalyst.

4,528,403

HYDROFORMYLATION PROCESS FOR PREPARATION OF ALDEHYDES AND ALCOHOLS

Kazuo Tano, Yokohama; Keiichi Sato, Kawasaki, and Toru Okoshi, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,783

Claims priority, application Japan, Oct. 21, 1982, 57-184858; Nov. 24, 1982, 57-205623

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **15 Claims**

1. A hydroformylation process which comprises hydroformylating an olefinic compound selected from the group consisting of dimers, trimers and tetramers of propylene, butene or isobutylene, by reacting said olefinic compound with water gas at a temperature of from 50° to 170° C. under water gas partial pressure of from 20 to 500 kg/cm² in a catalyst solution containing rhodium, an oxide of an organic trivalent phosphorus compound present in an amount such that the phosphrous concentration is at least 10 atoms per atom of rhodium, and high boiling by-products produced by side reactions, to form a hydroformylation product composed mainly of an aldehyde having a carbon atom number greater by one than the starting olefinic compound; adding an organic trivalent phosphrous compound to the reaction mixture, followed by distillation to separate a distillate containing the hydroformylation product from a high-boiling residue containing rhodium; oxidizing the high-boiling residue at the same time or as subsequent to the distillation, to convert the organic trivalent phosphorus compound to its oxide; and recycling the oxidized residue to the hydroformylation reaction zone.

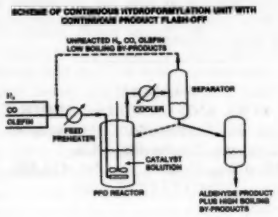
4,528,404
HIGH TEMPERATURE HYDROFORMYLATION IN THE PRESENCE OF TRIARYLPHOSPHINE RHODIUM CARBONYL HYDRIDE COMPLEX CATALYST SYSTEMS

Alexis A. Oswald, Mountainside; Joseph S. Merola, Scotch Plains, both of N.J.; John C. Reisch, Baton Rough, La., and Rodney V. Kastrup, High Bridge, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 475,809, Mar. 16, 1983, abandoned. This application Oct. 23, 1984, Ser. No. 664,037

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **34 Claims**



1. A homogeneous liquid phase hydroformylation process which comprises reacting a dissolved olefin with CO and H_2 at temperatures between about 120° and 200° C. and at a total pressure in the range of 100 to 1500 psia to selectively produce aldehydes in the presence of tris-triarylphosphine rhodium monocarbonyl hydride and bis-triarylphosphine rhodium dicarbonyl hydride complex catalyst free from halogen on the rhodium wherein the homogeneous reaction medium comprises oxygenated solvents comprising mainly straight chain and branched monohydric alcohols and aliphatic monocarboxylic acid esters and aldehyde acetals thereof, and branched aldehydes derived via aldol condensation and excess triaryl phosphine ligand as catalyst stabilizer modifier having a minimum of 1 mole per kg. phosphorus equivalent based on said reaction medium wherein the daily loss of catalyst activity is below 0.5%.

4,528,405
ALDOL CONDENSATION OF ENOLIZABLE ALDEHYDES USING A METAL CARBOXYLATE CATALYST

Anthony J. Papa, St. Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1983, Ser. No. 567,423

Int. Cl.³ C07C *45/45*

U.S. Cl. 568—463 **8 Claims**

1. In a process for the production of alpha, beta-unsaturated aldehydes by the aldol condensation of enolizable aldehydes in the presence of a catalyst, and wherein water is removed as formed during the reaction, the improvement comprising using as said catalyst a metal carboxylate selected from the group consisting of chromium (III) 2-ethylhexanoate and nickel (II) 2-ethylhexanoate.

4,528,406
PRODUCTION OF BIS(ALPHA-ALKYLBENZYL)ETHERS

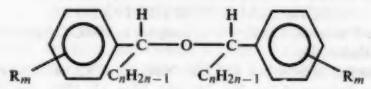
Mary T. Arnold, Upland, and George R. Siciliano, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 30, 1983, Ser. No. 556,505

Int. Cl.³ C07C *41/09*

U.S. Cl. 568—659 **11 Claims**

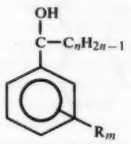
1. Process for the production of bis(alpha-alkylbenzyl) ethers corresponding to the formula:



(I)

wherein, R is a member selected from the group consisting of lower alkyl, lower haloalkyl, chloro, bromo, sulfo and nitro radicals; m is an integer not greater than 3 and n is an integer of from 1 to 7, inclusive, comprising:

(a) heating, while removing water of dehydration as formed, an alpha alkylbenzyl alcohol of the formula:



(II)

wherein, R, m and n are as defined above, with agitation, at a temperature below about 200° C. in the presence of an acidic clay present in catalytic amount and having a surface area of at least about 200 square meters per gram, and an acidity of at least 1 milligram potassium hydroxide per gram of clay for a time sufficient to effect conversion of at least about 75% of at said alcohol to the desired ether and thereby forming a reaction product mixture;

(b) introducing a basic compound to the reaction product mixture of Step (a), above, in an amount sufficient to deactivate the catalyst; and

(c) recovering the desired bis(alpha-alkylbenzyl) ether from the reaction product mixture.

4,528,407
CATALYTIC PROCESS FOR PREPARATION OF ORTHO-ALKYLATED PHENOLS

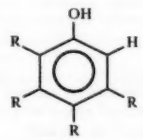
William E. Smith, Schenectady, and Richard A. Battista, Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 163,486, Jun. 27, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 314,622

Int. Cl.³ C07C *37/16, 39/06*

U.S. Cl. 568—804 **17 Claims**

1. A catalytic ortho-alkylation process which comprises reacting a phenolic compound of the formula:



where each R is a monovalent substituent selected from the group consisting of hydrogen, alkyl, phenyl and alkyl-substituted phenyl with an alcohol selected from the group consisting of C_{1-6} alkyl alcohols at a temperature from about 300° C. to the decomposition temperature of the reactants or catalyst in the presence of a catalyst composite consisting essentially of a calcination residue derived at said reaction temperatures from an admixture of magnesium carbonate and/or magnesium hydroxide and a manganese compound wherein said admixture is formed by precipitating said manganese compound in the presence of magnesium carbonate and/or magnesium hydroxide.

4,528,408

TRANS-3-SUBSTITUTED-1-INDANOL AND INSECTICIDAL ESTER DERIVATIVES

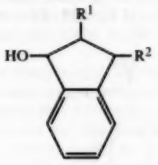
Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 445,136, Nov. 26, 1982, abandoned, which is a division of Ser. No. 245,484, Mar. 19, 1981, Pat. No. 4,362,744. This application Oct. 16, 1984, Ser. No. 660,569

Int. Cl.³ C07C *33/34*

U.S. Cl. 568—808 **4 Claims**

1. A 3-substituted-1-indanol of the formula



in which R^1 is hydrogen; R^2 is phenylmethyl, (lower alkylphenyl)methyl, or halophenylmethyl; and the 1,3-trans isomer is present in an isomeric excess over the 1,3-cis isomer of at least 50%.

4,528,409

PROCESS FOR THE PREPARATION OF CYCLIC ALCOHOL

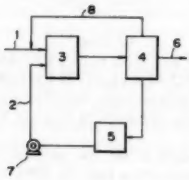
Osamu Mitsui, and Yohei Fukuoka, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Jul. 12, 1983, Ser. No. 513,030

Claims priority, application Japan, Apr. 15, 1983, 58-66792

Int. Cl.³ C07C *29/04*

U.S. Cl. 568—835 **16 Claims**



1. A process for the preparation of a cyclic alcohol from a cyclic olefin which comprises subjecting a cyclic olefin represented by the formula:

$$C_nH_{2n-2-m}R_m$$

wherein

R represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a cyclohexyl group,

n is an integer of from 5 to 12, and

m is an integer of from 1 to 4,

to catalytic hydration reaction using a reaction system including the cyclic olefin and an aqueous solution comprising water and an aromatic sulfonic acid as a catalyst and wherein said aqueous solution further comprises at least one heteropoly acid which contains, as poly atom, at least one member selected from the group consisting of Mo, W and V and further contains, as central atom, at least one member selected from the group consisting of P, As, Si, Ge, Ti, Ce, Th, Mn, Ni, Te, I, Co, Cr, Fe, Ga, B, V, Pt, Be and Zn, and in which the poly atom and the central atom are present in an atomic ratio of from 2.5 to 12, and said catalytic hydration reaction is carried out at a temperature within the range of from 50° to 200° C.

4,528,410

PROCESS FOR PREPARATION OF ALCOHOLS BY HYDRATION OF OLEFINS

Teruhisa Sakamoto; Satoshi Ishida, both of Shinnanyo; Toshio Hironaka, and Yukihiro Tsutsumi, both of Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,561

Claims priority, application Japan, Oct. 13, 1982, 57-178298; Oct. 14, 1982, 57-179101; Feb. 4, 1983, 58-16236

Int. Cl.³ C07C *29/04*

U.S. Cl. 568—897 **18 Claims**

1. A process for the preparation of alcohols by catalytically hydrating olefins wherein at least one crystalline aluminosilicate selected from the group consisting of offretite, ferrierite and erionite is used as a catalyst.

4,528,411

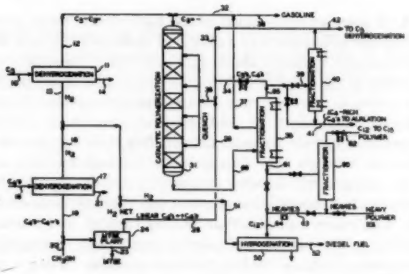
DIESEL FUEL AND GASOLINE PRODUCTION

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 24, 1982, Ser. No. 423,388

Int. Cl.³ C07C *1/00*

U.S. Cl. 585—329 **14 Claims**



1. A combination process for producing high quality diesel fuel and high quality gasoline which comprises the steps of

(a) polymerizing an olefinic C_3 cut comprising propylene in a polymerization zone containing a polymerization catalyst active for catalyzing polymerization of said olefins to linear olefin polymers boiling within the gasoline boiling range,

(b) contacting a mixture of methanol and an olefinic C_4 cut comprising isobutene, isobutane, and at least one n-butene with an acid catalyst under isobutene etherification conditions to produce methyltertiarybutyl ether and unreacted linear C_4 hydrocarbons, and

(c) introducing at least a portion of said unreacted linear C_4 hydrocarbons in (b) into said polymerization zone in (a) as quench to cool the polymer reaction and produce additional linear olefin polymer from linear C_4 olefin hydrocarbons in said at least a portion of said unreacted linear C_4 hydrocarbons in the presence of said propylene in (a).

4,528,412

DEHYDROCYCLODIMERIZATION PROCESS

Paul C. Steacy, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 11, 1984, Ser. No. 659,794

Int. Cl.³ C07C *3/03, 7/01*

U.S. Cl. 585—415 **18 Claims**

1. A process for the production of C_6-plus hydrocarbons which comprises the steps of:

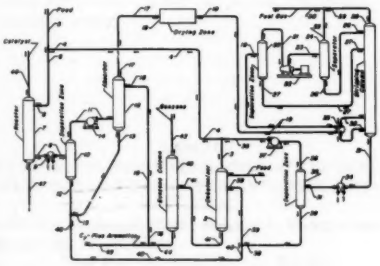
(a) passing a reactor charge stream which comprises a C_3 or C_4 aliphatic feed hydrocarbon into a reaction zone maintained at dehydrocyclodimerization conditions which

include the presence of a solid catalyst and producing a vapor phase reaction zone effluent stream which comprises unconverted feed hydrocarbon, hydrogen, by-product C_1 and C_2 hydrocarbons, benzene, toluene, and C_8 aromatic hydrocarbons;

(b) partially condensing the reaction zone effluent stream, and in a first vapor-liquid separation zone separating the resultant admixture into a first vapor stream which comprises hydrogen, C_1 and C_2 hydrocarbons, the feed hydrocarbon and benzene and a first liquid stream which comprises benzene, toluene, and C_8 aromatic hydrocarbons;

(c) passing the first vapor stream through an absorption zone maintained at benzene absorption-promoting conditions and in which the first vapor stream is contacted with a lean absorption liquid stream and producing a second vapor stream which comprises hydrogen, C_1 and C_2 hydrocarbons, and the feed hydrocarbon and a rich absorption liquid stream which comprises the feed hydrocarbon, benzene, and toluene;

(d) partially condensing the second vapor stream, and in a second vapor-liquid separation zone separating the resultant admixture into a third vapor stream comprising hydrogen, C_1 and C_2 hydrocarbons and the feed hydrocarbon and a second liquid stream which comprises the feed hydrocarbon;



(e) depressurizing the third vapor stream under conditions which result in a partial condensation of the third vapor stream and the production of a fourth vapor stream which comprises hydrogen and C_1 hydrocarbons and a third liquid stream which comprises C_2 hydrocarbons and the feed paraffin;

(f) passing the second and the third liquid streams into a stripping column operated at conditions effective to separate the entering hydrocarbons into a net overhead stream which comprises C_1 hydrocarbons and a net bottoms stream which comprises the feed hydrocarbon;

(g) recycling at least a portion of the net bottoms stream to the reaction zone as a portion of said feed stream;

(h) passing the first liquid stream and the rich absorption liquid stream into a fractionation zone operated at fractionation conditions which separate entering hydrocarbons into at least a C_6 hydrocarbon-rich process stream, a C_7-plus hydrocarbon-rich process stream, and a fifth vapor stream which comprises the feed hydrocarbon; and

(i) removing the C_6 hydrocarbon-rich process stream and a first portion of the C_7-plus hydrocarbon-rich process stream from the process as products and passing a second portion of the C_7-plus hydrocarbon-rich process stream into the absorption zone as the previously referred to lean absorption liquid stream.

4,528,413
PROCESS FOR THE SYNTHESIS AND PURIFICATION OF DIISOPROPENYLBENZENE

Howard A. Colvin, Akron; Ronald D. Fiedler, Atwater; Joel Muse, Jr., Kent, and Donald E. Smith, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 5, 1984, Ser. No. 586,166
Int. Cl.³ C07C *5/333*
U.S. Cl. 585—440 **12 Claims**

1. A process for the synthesis and purification of diisopropenylbenzene from diisopropylbenzene and regenerated diisopropylbenzene which comprises: (1) dehydrogenating diisopropylbenzene to form a dehydrogenation mixture containing diisopropenylbenzene and organic impurities including a number of olefinic impurities, (2) continuously distilling said dehydrogenation mixture to separate said diisopropenylbenzene from said organic impurities, (3) fully hydrogenating said organic impurities to form a mixture of regenerated diisopropylbenzene and saturated organic impurities, (4) fractionally distilling said mixture of regenerated diisopropylbenzene and saturated organic impurities under conditions sufficient to separate said regenerated diisopropylbenzene from said saturated organic impurities, and (5) recycling said regenerated diisopropylbenzene to the first step of this process for dehydrogenation.

4,528,414
OLEFIN OLIGOMERIZATION

Gary N. Long, Putnam Valley; Regis J. Pellet, Croton-On-Hudson, and Jule A. Rabo, Armonk, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 15, 1983, Ser. No. 551,881
Int. Cl.³ C07C *3/16*
U.S. Cl. 585—514 **23 Claims**

1. The process for the oligomerization of linear and/or branched chain C_2 to C_{12} olefins which comprises contacting said olefins at effective process conditions for said oligomerization with an oligomerization catalyst comprising a silicoaluminophosphate "SAPO", characterized by an adsorption of triethylamine of less than 5 percent by weight at a pressure of 2.6 torr and a temperature of 22° C.

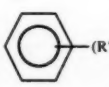
4,528,415
ETHYLENE DIMERIZATION

Ronald D. Knudsen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 517,108, Jul. 25, 1983, Pat. No. 4,487,847.
This application Aug. 20, 1981, Ser. No. 642,007
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—527 **12 Claims**

1. A process for the oligomerization of ethylene which comprises contacting said ethylene with a catalyst composition in the liquid phase present in at least one solvent selected from the group consisting of:

(i) an aromatic hydrocarbon of the formula



wherein each R''' independently represents a C_1 to C_6alkyl radical and n is 0, 1, 2, 3, or 4; and

(ii) an alcohol of the formula $(R^{iv})_3COH$ wherein each R^{iv}independently represents H or a C_1 to C_{12} alkyl, cycloalkyl, aryl, alkaryl, or aralkyl radical; the catalyst consisting essentially of:

(a) at least one nickel compound selected from the group consisting of:

bis(1,5-cyclooctadiene)nickel(0);

bis(tricyclohexylphosphine)nickel(0);

(cyclododecatriene)nickel; and

bis(ethylene)(dicyclohexylphosphine)nickel;

(b) a phosphine compound of the formula PR_3 wherein each R independently represents H or a C_1 to C_{20} hydrocarbyl radical with the proviso that any alkenyl substitution be at least 3 carbon atoms removed from the phosphorus atom and at least one R is not H; and

(c) an acidic compound selected from the groups consisting of

(i) a sulfonic acid of the formula $R'SO_3H$ wherein R' is H, or a fluorinated or nonfluorinated alkyl, aryl, alkaryl, or aralkyl radical with 1–10 carbon atoms.

4,528,416

ETHYLENE OLIGOMERIZATION PROCESS CARRIED OUT IN A MONOHYDRIC/DIHYDRIC ALCOHOL SOLVENT MIXTURE

Eugene F. Lutz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 9, 1984, Ser. No. 658,949

Int. Cl.³ C07C *3/21*

U.S. Cl. 585—527 **28 Claims**

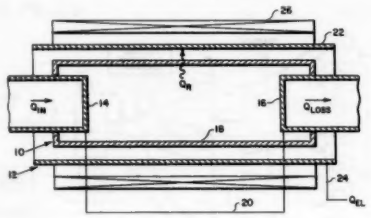
1. In a process for the preparation of oligomers of ethylene which comprises reacting ethylene in a polar solvent and in the presence of a catalyst which is a chelate of nickel with a bidentate ligand, the improvement which comprises reacting the ethylene under a partial pressure of ethylene of at least about 800 psig in a solvent mixture which comprises between about 40 and 82 percent by weight of one or more lower aliphatic dihydric alcohols and between about 18 to 60 percent by weight of one or more lower aliphatic monohydric alcohols, said percentages by weight being calculated on the total weight of the one or more lower aliphatic dihydric alcohols and the lower aliphatic monohydric alcohols in the solvent mixture.

4,528,417

THERMIONIC-PHOTOVOLTAIC ENERGY CONVERTER

Donald L. Chubb, Olmsted Falls, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 15, 1984, Ser. No. 580,573
Int. Cl.³ H01L *31/00*
U.S. Cl. 136—253 18 Claims



1. A thermionic-photovoltaic energy conversion device comprising

thermionic means for providing a discharge that produces line radiation in a relatively narrow range of wavelengths, and

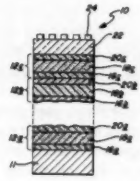
photovoltaic means isolated from said thermionic means and responsive to said wavelengths in said relatively narrow range for converting photons in said line radiation into electrical energy.

4,528,418

PHOTORESPONSIVE SEMICONDUCTOR DEVICE HAVING A DOUBLE LAYER ANTI-REFLECTIVE COATING

John McGill, Rochester, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Feb. 24, 1984, Ser. No. 582,984
Int. Cl.³ H01L *31/04, 31/18*
U.S. Cl. 136—256 24 Claims



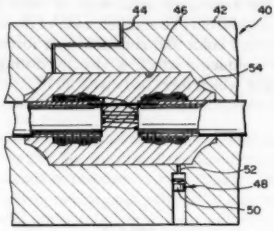
1. An improved p.i.n. type photovoltaic device having a transparent conductive oxide light incident layer thereon and in contact with an outermost layer of n-type conductivity amorphous silicon alloy material of the device, wherein the said outermost layer of n-type conductivity silicon alloy material has an index of refraction intermediate to and substantially equal to the square root of the product of the indices of refraction of the light incident layer and of the subjacent semiconductor body, said alloy material including silicon, hydrogen, fluorine, nitrogen, and phosphorous for substantially reducing the reflection of light and broadening the band width in the optimum operating range of the p.i.n. type photovoltaic device, whereby additional light energy is provided to the p.i.n. type photovoltaic device.

4,528,419

FORMING OF CABLE SPLICE CLOSURES

Leonard J. Charlebois, Kanata; Ronald R. D'Aoust, Nepean, and Fred A. Huszarik, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 12, 1983, Ser. No. 560,542
Int. Cl.³ H02G *15/08;* H01R *5/02*
U.S. Cl. 174—88 R 10 Claims



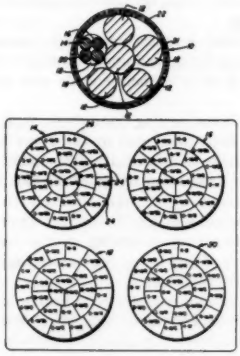
8. An assembly of two telecommunications cables disposed end-to-end with conductors of each cable core electrically connected each to one conductor of the other cable to form a conductor splice, the conductors for each splice extending outwardly from the cores and extending axially alongside core surrounding material of one of the cables to dispose the splice radially outwards of the core surrounding material with splices disposed in spaced positions both axially of and circumferentially around an end portion of the core surrounding material, each splice individually sealed by sealing material, and an encapsulation extending across the two cable ends so as to surround the sealed splices and end portions of the core surrounding material.

4,528,420

COLOR CODING IDENTIFICATION OF CONDUCTORS IN TELECOMMUNICATIONS CABLE

Paul P. Kish, Dorval, and Giovanni J. Discenza, Ville Ste. Catherine, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 8, 1983, Ser. No. 483,222
Int. Cl.³ H01B *7/36*
U.S. Cl. 174—112 12 Claims



1. A binder unit for telecommunications cable having twenty-five pulp or paper insulated ring conductors forming a first conductor set and twenty-five pulp insulated tip conductors forming a second conductor set and in which:

(a) each ring conductor forms a twisted pair with a tip conductor thus providing twenty-five pairs;

(b) the conductor insulations have colors, a maximum of eight colors being present in the twenty-five pairs with the same colors used in both sets with each of the conductor sets having at least three colors, and with colors distinguishing certain of the conductors in each set from one another;

(c) the insulation colors of the conductors in one of the sets all having a common style; and

(d) with the conductor insulations of each pair visually distinguished from one another, each of the conductors of one common color and common style forms a pair with another conductor which is visually distinguished from conductors which form pairs with all other conductors of said one common insulation color and common style.

4,528,421

PORCELAIN GAS-FILLED BUSHING WITH ELECTRODES FOR MODERATING THE ELECTRIC FIELD

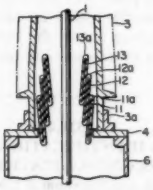
Mitsuhiro Kishida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,621

Claims priority, application Japan, Nov. 17, 1982, 57-203101

Int. Cl.[3] **H01B** *17/28, 17/36, 17/42*

U.S. Cl. 174—143 **3 Claims**



1. A bushing for connection to a vessel which contains electrical equipment and has a base portion provided with a vessel opening, and to be filled with an insulating gas, said bushing comprising:

a porcelain tube having an upper end opening and a lower end opening;

an upper terminal over said upper end opening;

an upper fixture fixing said upper terminal over said upper end opening so as to hermetically seal said upper end opening;

a central conductor, passing centrally through said porcelain tube, electrically connected to said upper terminal;

means, including an electrically groundable fitting flange and a lower fixture coupleable to the base portion of the vessel, for mounting said porcelain tube to the base portion of the vessel with said lower opening in fluid communication with the vessel opening, so as to hermetically seal the periphery of said lower end opening against the intrusion of atmospheric air;

an electric field adjusting electrode having inner and outer peripheral surfaces terminating at upper and lower peripheral edges, located inside said porcelain tube at a predetermined spacing from said central conductor and electrically connected to said fitting flange, said electrode surrounding said central conductor and being flared radially outwardly from a lower end toward an upper end thereof; and

an insulating member covering the inner and outer peripheral surfaces and upper and lower peripheral edges of said electrode.

4,528,422

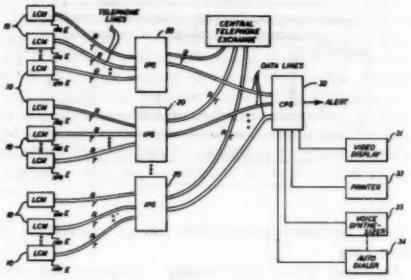
TRANSPARENT SECONDARY INFORMATION TRANSMISSION SYSTEM FOR AN INFORMATION TRANSMISSION SYSTEM

Carmine Cupani, Bronx, N.Y., assignor to The Inteleplex Corporation, Pleasantville, N.J.

Filed Jun. 27, 1983, Ser. No. 508,127

Int. Cl.[3] **H04M** *11/06*

U.S. Cl. 179—2 A **5 Claims**

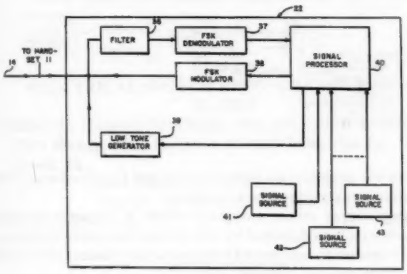


1. Apparatus adapted to be connected in a telephone system for transmitting signals between a first location and a second location in the telephone system comprising first means adapted to be coupled to a pair of ring and tip lines of the telephone system at the first location and to earth ground for transmitting to the second location substantially a first signal simultaneously on both said ring and tip lines such that substantially no signal is produced across said ring and tip lines from transmission of said first signal on both said ring and tip lines, second means adapted to be coupled to the ring and tip lines at the second location and earth ground for transmitting to the first location substantially a second signal simultaneously on both said ring and tip lines such that substantially no signal is produced across said ring and tip lines from transmission of said second signal on both said ring and tip lines and for receiving said first signal at said second location in the telephone system, said first means further comprising balanced modulator/demodulator means for receiving said second signal from said second location transmitted on said ring and tip lines, said first balanced modulator/demodulator means further comprising modulator means for converting said first signal into a modulated signal, amplifier means for increasing the amplitude of said modulated signal so as to produce an amplified modulated signal, said amplified modulated signal present on an output of said amplifier means, said output coupled to telephone line coupling means, said telephone line coupling means comprising resistor/capacitor circuit means coupled to both said ring and tip lines of said telephone system for coupling said amplified modulated signal to both said ring and tip lines and further comprising means for adjusting said amplified modulated signal so that said amplified modulated signal is substantially undetected across said ring and tip lines but may be detected across either of said ring and tip lines and earth ground, whereby said first means for transmitting is substantially transparent to said telephone system, and further comprising duplexer means coupled to the output of said amplifier means and to said telephone line coupling means, said duplexer means having an output coupled to filter means, said duplexer means allowing said second signal received by said telephone line coupling means to be coupled to said filter means, said received signal being coupled to demodulator means of said balanced modulator/demodulator means for converting said received signal into a demodulated signal for reception at said first location.

4,528,423
REMOTE SUBSCRIBER TERMINAL UNIT

Rolland T. James, Collingswood, and Ronald J. Chebra, Mercerville, both of N.J., assignors to Rase Ten Systems, Inc., Trenton, N.J.

Division of Ser. No. 327,486, Dec. 4, 1981, Pat. No. 4,442,320.
This application Jan. 18, 1984, Ser. No. 571,744
The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.
Int. Cl.[3] G08B *26/00*; H04M *11/04*
U.S. Cl. 179—5 R **16 Claims**



1. A subscriber terminal unit for use in a system for providing communication between a central location and an instrumentality other than a conventional telephone located at the premises of a telephone network subscriber, said subscriber terminal unit comprising:

means connected to a telephone and responsive to a signal transmitted from the central location for retransmitting to the central location a signal in the audible telephone frequency range and of characteristics indicative of the state of the instrumentality;

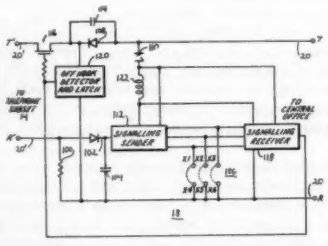
means for transmitting to the central location a signal at a frequency below the audible range when the instrumentality is in a predetermined state;

and means responsive to the instrumentality changing to another predetermined state to interrupt the transmission of said below-audible-range signal.

4,528,424
MULTIPARTY LINE ADAPTER WITH PRIVACY FEATURE CONTROLLED BY REVERSAL OF LINE POLARITY AT A CENTRAL POWER SOURCE

Francisco A. Middleton, Sandy Hook; Santanu Das, Shelton, and Franklin Hargrave, Newtown, all of Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 24, 1983, Ser. No. 507,364
Int. Cl.[3] H04M *1/70, 3/16*
U.S. Cl. 179—17 A **21 Claims**



1. A multiparty line adaptor circuit for enabling a telephone subset to share a single subscriber line from a local or central office with one or more other subscriber subsets, each of said subsets having a similar multiparty line adaptor circuit associated therewith, each of said multiparty line adaptor circuits comprising:

means for detecting the flow of current in subscriber tip and ring lines when the subscriber goes off-hook;

means for detecting a polarity reversal on said tip and ring lines initiated by said flow of current;

signalling means enabled in response to said polarity reversal on said tip and ring lines for generating and coupling a unique identification signal to said tip and ring lines;

means for generating a signal and coupling said signal to said single subscriber line for enabling all of said multiparty line adaptor circuits sharing said subscriber line in response to said polarity reversal;

means for generating a signal and coupling said signal to said single subscriber line for disabling all said multiparty line adapter circuits in response to said polarity reversal;

signalling receiver means responsive to an interrogate signal to cause said multiparty line adaptor circuit to transmit a unique identification signal to the said subscriber line;

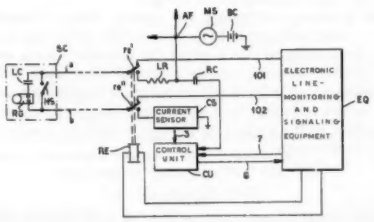
means responsive to said unique identification signal to enable said multiparty line adaptor circuit such that ringing current can be received from said subscriber line at said enabled multiparty line adaptor circuit, and such that none of said disabled multiparty line adaptor circuits receives said ringing current; and

means for receiving said identification signals such that only the calling subscriber and the uniquely identified called subscriber are coupled to the subscriber line, and such that all other subscribers on said multiparty line are disabled and uncoupled thereby maintaining privacy of communication on said multiparty line between said calling and called subscriber.

4,528,425
METHOD OF AND CIRCUITRY FOR DETECTING, AT A TELEPHONE EXCHANGE, THE LIFTING OF A SUBSCRIBER'S HANDSET IN RESPONSE TO RINGING CURRENT EMITTED BY THE EXCHANGE

Flavio Melindo, and Mario Sartori, both of Turin, Italy, assignors to Cselt-Centro Studi E Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed Mar. 24, 1983, Ser. No. 478,470
Claims priority, application Italy, Mar. 24, 1982, 67371 A/82
Int. Cl.[3] H04M *3/02*
U.S. Cl. 179—18 HB **15 Claims**



5. In a telephone system wherein an exchange is linked with an associated subscriber station via a two-conductor line whose conductors are interconnected at said station by a ringer in series with a capacitor shunted by a normally open hook switch, said ringer being operable in an open state of said hook switch by alternating current of low audio frequency transmitted over said line along with a continuous voltage whereby a direct-current component is superimposed upon said alternating current on closure of said hook switch,

the combination therewith of circuitry for detecting said

direct-current component as a signal that the hook switch has been closed, said circuitry comprising:

sensing means coupled to said line for producing a monitoring current of a magnitude proportional at least in absolute magnitude to the line current;

conversion means connected to said sensing means for deriving from said monitoring current a bipolar current proportional to said line current;

timing means responsive to said alternating current for establishing a recurrent measuring period spanning a whole number of cycles of said low audio frequency;

integrating means connected to said conversion means and controlled by said timing means for determining the mean amplitude of said bipolar current over each measuring period; and

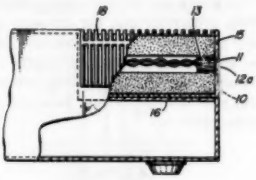
comparison means connected to said integrating means for signaling a surpassing of a predetermined minimum value by said mean amplitude.

4,528,426

DIRECTIONAL MICROPHONE ASSEMBLY

Peter Fatovic, Ottawa, and Conrad D. Lafrance, Aylmer, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 25, 1983, Ser. No. 555,139
Int. Cl.³ H04R *1/28*
U.S. Cl. 179—121 D **4 Claims**



1. A microphone assembly comprising:

an electroacoustic transducer, housed in a capsule having a forward facing opening and a plurality of sideward facing openings spaced around the perimeter of the capsule, said openings coacting with the electroacoustic transducer to provide a preselected free-field directional response characteristic;

the capsule being surrounded and supported on at least the perimeter by an acoustically transparent foam covering which overlays the openings, and which disperses acoustic waves passing therethrough;

the covering containing the capsule being mounted in a housing contiguous to an acoustically reflecting surface of the housing so that some of the sideward facing openings receive acoustic waves reflected from said reflecting surface, whereby the foam covering disperses the acoustic waves reflected from the surface so as to minimize the effect of the surface on the free-field directional response characteristic.

4,528,427

TEST SYSTEM AND DEVICE FOR LOCATING SHORT CIRCUITS AND OPEN CIRCUITS IN A TWO-LEAD LINE

Michel P. Gadonna, 148 rue Boucicaut, 92260 Fontenay-aux-Roses, and Joël R. Kastler, 3, Sentier des Bas Garmants, 92240 Malakoff, both of France

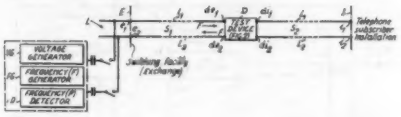
Filed Aug. 3, 1982, Ser. No. 404,914
Claims priority, application France, Aug. 14, 1981, 81 15722
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—175.3 F **47 Claims**

1. A test device adapted to be connected in a system for locating short circuits and open circuits in a two-lead line, the test device being adapted to be connected in said line at a position to divide the line into first and second line sections; the system including: means selectively connected to one end of said first line section for generating a predetermined voltage, means selectively connected to said one end of said first line section for detecting a first predetermined frequency, and means selectively connected to said one end of said first line section for generating a second predetermined frequency;

said test device comprising:

means series-connected with one of said line leads for detecting an in-line current;

means connected across said line for detecting said predetermined voltage;



means for generating a signal having said first frequency for modulating said in-line current;

voltage supply means energized either in response to said in-line current detected by said current detecting means or in response to said predetermined voltage detected by said voltage detecting means;

means supplied by said supply means for detecting a signal having the second frequency in said line; and

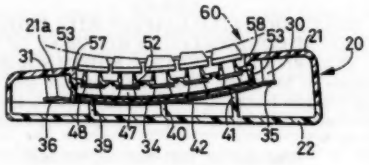
switching means for looping said first line section across said first frequency generating means in response to detection of said second frequency.

4,528,428

KEY-HOLDING STRUCTURE OF KEYBOARD WITH CURVED OPERATING SURFACE OF KEYS

Hideo Gotoh; Satoshi Fukao, and Makoto Suzuki, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 10, 1984, Ser. No. 598,920
Claims priority, application Japan, Apr. 20, 1983, 58-59365[U]
Int. Cl.³ H01H *9/00, 13/70*
U.S. Cl. 200—5 A **18 Claims**



1. A keyboard having multiple key-switches each comprising a key having a finger-pressed top face, a movable electrode and at least two stationary electrodes, comprising:

an upper casing including a portion which has a rectangular aperture formed through a thickness of said portion, and a pair of side walls defining opposite right and left sides of said rectangular aperture, said side walls each having a downward extension from one surface of said portion, said downward extension having a convex profile at its lower end;

a key holder plate supporting the multiple keys in plural rows perpendicular to said right and left sides and movably in a direction perpendicular to a plane of the key holder plate, said key holder plate having holes through which said keys extend in said direction, and further having integral guide portions formed concentrically with said holes and extending in said direction towards said rectangular aperture;

retaining means for holding said key holder plate curved in cross section across said plural rows, with elastic deformation thereof in pressed contact with said convex profile of said downward extension, whereby a surface generally defined by the top faces of said multiple keys is curved to said convex profile in said cross section;

a printed circuit board disposed below said key holder plate and having a pattern of said stationary electrodes such that said key-switches are operated upon movement of said multiple keys; and

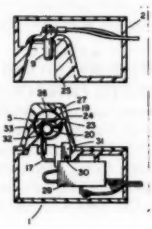
a lower casing disposed below said printed circuit board and cooperating with said upper casing to enclose said key holder plate, said retaining means and said printed circuit board.

4,528,429

ELECTRICAL SWITCH-PLUG ASSEMBLY WITH BAFFLE

William C. Dobson, West Bend, Wis., and Carl R. Spoeth, New Port Richey, Fla., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Mar. 2, 1984, Ser. No. 583,631
Int. Cl.³ H01H *9/20;* **H01R** *33/30*
U.S. Cl. 200—50 B **23 Claims**



1. A plug and socket electrical connector, comprising:

(a) a plug having an electrically conductive plug prong,

(b) a socket engagable with said plug, having a passage comprising one or more apertures and an electrically conductive socket contact proximate said passage, said passage adapted to receive at least a portion of said plug prong in a position of engagement with said socket contact,

(c) means for establishing electrical union between said socket contact and a power supply,

(d) a movable baffle rotatably supported by said socket, having a shield movable to a closed position intermediate said passage and said socket contact and movable to an open position in which said socket contact is exposed to said passage,

(e) a baffle control arm rotatably supported by said socket and cooperative with said baffle, movable to a first position corresponding to said closed position of said shield, and having an engagement surface separate from said shield engagable to move said baffle control arm from said first position to a second position corresponding to said open position of said shield,

(f) means for moving said shield from said open position to said closed position when said baffle control arm is disengaged,

(g) means for moving said baffle control arm from said second position to said first position when said baffle control arm is disengaged, and

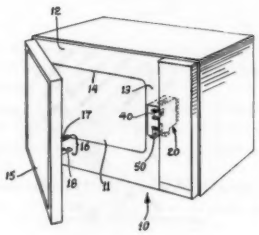
(h) a projection carried by said plug separate from said plug prong in a position of alignment with said engagement surface when said plug prong is in alignment with said passage, adapted to engage said engagement surface and to move said baffle control arm from said first position to said second position as said plug prong is moved from said position of alignment toward said position of engagement with said socket contact, whereby said shield is moved to said open position and said socket contact is exposed to said plug prong for engagement to establish an electrical connection between said socket and said plug.

4,528,430

ELECTRICAL APPLIANCE INTERLOCK SWITCH WITH FORCE EFFICIENT ACTUATOR

Raymond Lewandowski, Mount Prospect, and Raymond A. Leger, Crystal Lake, both of Ill., assignors to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jul. 12, 1983, Ser. No. 512,928
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.62 **8 Claims**



4. In an interlock switch, adapted for use with an electrical appliance having probe means, a housing and actuator means operable by said probe means, the improvement comprising:

a first cantilevered conductive switch element, mounted in said housing, normally biased against the direction of movement of said actuator means when operated by said probe means;

a second cantilevered conductive switch element, mounted in said housing, normally biased toward the direction of movement of said actuator means when operated by said probe means; and

a third cantilevered conductive switch element, mounted in said housing, normally biased against the direction of movement of said actuator means when operated by said probe means, whereby the force required to operate said actuator means is reduced by the opposing forces applied to said conductive switch elements.

4,528,431

ROCKING SWITCH ACTUATOR FOR A LOW FORCE MEMBRANE CONTACT SWITCH

Edwin T. Coleman, III, Versailles, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,728
Int. Cl.³ H01H *13/30*
U.S. Cl. 200—67 A **23 Claims**

1. A rocking switch actuator for a low force membrane contact switch including:

frame means;

a vertically movable key slidably mounted on said frame means;

a membrane contact switch assembly mounted on said frame means below said key;

said membrane contact switch assembly including a contact switch;

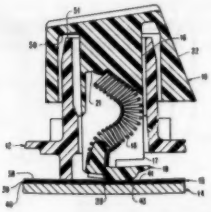
a rocking actuator for causing opening and closing of said contact switch, said actuator having an upper surface and

a bottom surface located on said membrane contact switch assembly;

a buckling spring retained between said key and said actuator, said spring having one end acting against said key and its opposite end acting against said upper surface of said actuator, said spring being slightly compressed and slightly buckled in a selected direction when said bottom surface of said actuator is located on said membrane contact switch assembly and said key is not actuated;

said bottom surface of said actuator including a first surface on which said actuator rests on said membrane contact switch assembly when said key is not actuated so that said actuator is in its rest position, said first surface being disposed relative to said contact switch so that the force of said spring when said actuator is in its rest position cannot cause closure of said contact switch;

said actuator having a downwardly extending portion located adjacent said contact switch of said membrane



contact switch assembly and having its bottom surface form part of said bottom surface of said actuator, said bottom surface of said downwardly extending portion being curved along its periphery from at least said first surface to at least where closure of said contact switch by said actuator occurs;

downward actuation depression of said key causing said spring to compress and to buckle further in the selected direction to produce rotation of said actuator from its rest position to cause said downwardly extending portion to rotate downwardly on said contact switch to effect closure thereof and to lift said first surface from said membrane contact switch assembly, and release of said key causing said spring to unbuckle to rotate said actuator back to said first surface to open said contact switch;

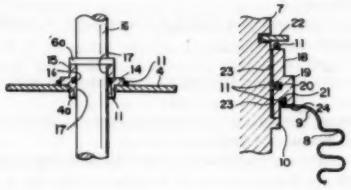
and said actuator including means to prevent extra opening and closure of said contact switch during return of said actuator to its rest position.

4,528,432

VACUUM INTERRUPTER

Katsuaki Senba, and Junichi Warabi, both of Numazu, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,978
Claims priority, application Japan, May 20, 1983, 58-88745
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **10 Claims**



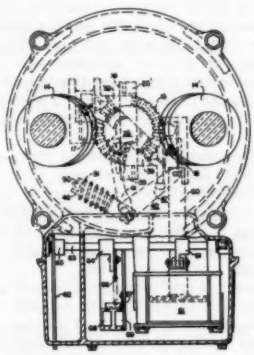
1. A vacuum interrupter including an envelope which comprises at least one cylinder, two annular end plates connected in a vacuum-tight manner to the opposite ends of the cylinder, a pair of electrical lead rods of copper or a copper-based alloy, an inner end of each electrical lead rod having an electrical contact, and one electrical lead rod being brazed in a vacuum-tight manner to one end plate via a first sealing means, and a bellows of an iron-based alloy surrounding another electrical lead rod, an outer end of the bellows being joined in a vacuum-tight manner to another end plate and an inner end of the bellows being brazed in a vacuum-tight manner to the other electrical lead rod via a second sealing means, the pair of electrical lead rods being electrically disconnected when the contacts are separated, wherein the first and second sealing means have generally tubular sealing members made of an iron-based alloy and fitted onto the corresponding electrical lead rod, and wherein a groove retaining a solid brazing metal and two vacuum-tight brazing surfaces opposing the corresponding electrical lead rod with a small clearance are formed in the inner wall of each sealing member.

4,528,433

ELECTRICALLY OPERATED SWITCH HAVING AN IMPROVED LINKAGE MEANS

Oral L. Riggins, Odon; Sherry J. Mills, Solsberry; John H. Warkentin; Joseph P. Stephans, both of Bloomington, all of Ind., and Clancy O. Wisdom, Mattapan, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 18, 1983, Ser. No. 486,581
Int. Cl.³ H01N *33/68, 33/04*
U.S. Cl. 200—150 C **3 Claims**



1. Electrical switch apparatus, comprising:

(a) a rotary contact means and stationary contact means combination disposed to open and close an electric circuit;

(b) operating means including a toggle mechanism for effecting rotary movement of the rotary contact means into engagement with the stationary contact means;

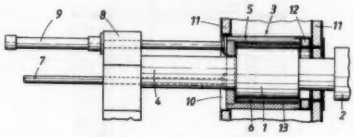
(c) the rotary contact means and stationary contact means combination being supported by a generally cylindrical support structure connected thereto over which the rotary contact means travels with spaced openings in the structure to aid in the breakup and extinguishing of arcs; and

(d) the toggle mechanism having a slot creating an inclined plane at the midpoint of the mechanism preventing the toggle mechanism from having a dead center position.

4,528,434
COILER-FURNACE UNIT

Franz Hirschmanner, Leonding, and Ernst Rom, St. Veit, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Feb. 22, 1983, Ser. No. 468,083
Claims priority, application Austria, Mar. 23, 1982, 1122/82
Int. Cl.[3] H05B 5/00
U.S. Cl. 219—10.49 A 4 Claims



1. In a coiler-furnace unit comprising a coiler having a coiler mandrel arranged for carrying a strip wound on the mandrel, the improvement comprising

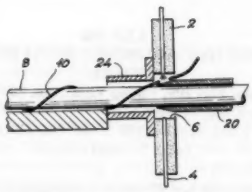
(a) a heating device arranged for selective movement between a first position wherein the heating device surrounds and heats the coiler mandrel, and a second position wherein the heating device is removed from the coiler mandrel, and

(b) the heated coiler mandrel being adapted to heat the strip wound thereon in the second position of the heating device.

4,528,435
WIRE CUTTING PROCESS AND APPARATUS

Claude Billon-Pierron, St. Etienne de Crossey; Jean Chavand, Grenoble, and Michel Peccoud, Claix, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 18, 1984, Ser. No. 571,804
Claims priority, application France, Jan. 25, 1983, 83 01094
Int. Cl.[3] B23K 9/225, 31/10
U.S. Cl. 219—69 M 4 Claims



1. A process for cutting a wire or a thin elongated metal part wound around a member having an elongated shape over at least part of the length thereof, said process comprising the following steps:

striking a series of successive electric arcs between a series of electrodes located in a plane transverse of said member, said member being motionless with respect to the electrodes, the arrangement of the electrodes being such that the impact points of the arcs partly overlap so that the wire is struck by at least one of the arcs and is cut,

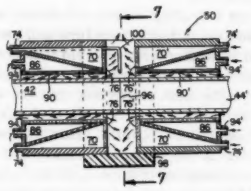
advancing said member by a predetermined length, and

striking another series of arcs in another plane transverse of said member, thus cutting the wire into pieces of a predetermined length.

4,528,436
HIGH RELIABILITY DOUBLE-CHAMBERED SHIELDING SYSTEM FOR WELDING

Israel Stol, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 20, 1984, Ser. No. 591,360
Int. Cl.[3] B23K 9/16
U.S. Cl. 219—74 17 Claims



1. Apparatus for gas-shielding a circumferential process zone about an elongate workpiece during welding or heat treating, comprising:

means defining a first chamber having at least one inlet adapted for connection to a source of inert gas, and an annular outlet surrounding said workpiece adjacent the process zone;

first gas diffuser means mounted over the outlet of said first chamber for facilitating even flow of inert gas into the zone;

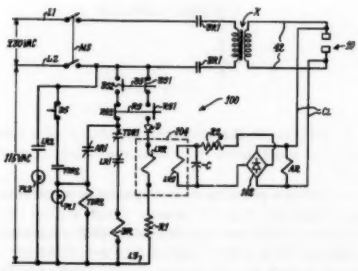
means defining a second chamber having at least one inlet adapted for connection to a source of inert gas, and a cylindrical outlet surrounding said workpiece in predetermined spaced relationship therewith and extending away from the process zone; and

second gas diffuser means mounted over the outlet of said second chamber for facilitating even flow of gas along the workpiece.

4,528,437
ELECTRICAL BRAZING ANTI-ARCING CONTROL CIRCUIT

Jesse W. Burnett, and Homer H. Hall, both of Rome, Ga., assignors to General Electric Company, King of Prussia, Pa.

Filed Jun. 28, 1983, Ser. No. 508,685
Int. Cl.[3] B23K 11/24
U.S. Cl. 219—85 CA 9 Claims



1. An anti-arcing control circuit for electrical brazing equipment, said control circuit comprising, in combination:

a pair of control circuit power lines for connection to an electrical power source;

a contactor relay having an operating coil connected across said power lines and normally open contacts operating in the power circuit for the brazing equipment to control the flow of brazing current to the electrodes thereof;

a normally open, manually operated brazing switch connected in series with said contactor relay coil across said power lines, closure of said brazing switch completing an energization circuit for said contactor relay coil to precipitate closure of said contactor relay contacts and the commencement of brazing current flow to the brazing equipment electrodes;

a pair of control leads connected across the brazing equipment electrodes;

arc voltage detecting means connected with said control leads and operating to interrupt said energization circuit for said contactor relay coil and thus open said contactor relay contacts in response to the existence of arcing at the brazing equipment electrodes, said arc voltage detecting means being a latching relay having a first operating coil connected with said control leads, a second operating coil connected across said power lines, and normally closed contacts connected in series with said contactor relay coil and said brazing switch across said power lines, whereby said first operating coil is activated by the presence of an arc voltage at the brazing equipment electrodes to effect a sustained opening of said latching relay contacts; and a manually operated, normally open reset switch connected in series with said latching relay second operating coil across said power lines, closure of said reset switch activating said second operating coil to effect a sustained closure of said latching relay contacts.

4,528,438

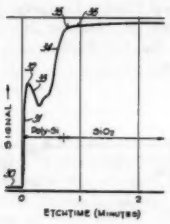
END POINT CONTROL IN PLASMA ETCHING

Robert G. Poulsen; Gerald M. Smith, and William D. Westwood, all of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 724,015, Sep. 16, 1976, abandoned. This application Jan. 7, 1983, Ser. No. 456,506

Int. Cl.[3] **B23K** *9/00;* **C23C** *15/00*

U.S. Cl. 219—121 PE **16 Claims**



1. A process for the uniform application of a pattern to a plurality of workpieces by selective etching, comprising the steps of:

(a) exposing a plurality of workpieces in a reaction space to a chemically reactive plasma which etches the exposed surface of each workpiece by chemically reacting with the material from which said surface is comprised;

(b) monitoring the variation over time of the amplitude of at least one atomic emission line of the atomic emission spectrum of said plasma during the reaction of said plasma with said workpieces, said emission line having an amplitude which is sensitive to the concentration in said plasma of a member selected from a product of said reaction or an etching radical; and

(c) determining the end point of said selective etching by a change in said amplitude.

4,528,439

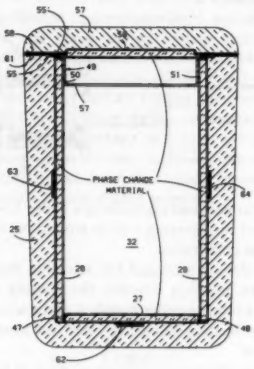
PORTABLE THERMALLY INSULATED CASE

O. Guy Marney, Jr., and Henry J. McKinley, Jr., both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 29, 1982, Ser. No. 437,770

Int. Cl.[3] **C09K** *5/06;* **H05B** *1/00*

U.S. Cl. 219—386 **15 Claims**



1. A thermally insulated case including:

an outer shell having a low thermal conductivity material on its inner surface;

said outer shell having first container means disposed adjacent said low thermal conductivity material on the inner surface thereof;

said first container means defining an interior recess bounded by said first container means excepting a first access opening to said recess;

said first container means having a leak-resistant phase change material therein for heat exchange with any object within said recess;

said leak-resistant phase change material comprising a mixture of water, gelatin, sodium benzoate and a biocide;

said outer shell having a second access opening communicating with said first access opening;

and closing means to close said second access opening.

4,528,440

HAND HELD HOT AIR DRYER WITH RETRACTABLE CORD

Naoki Ishihara, Flat 209, Viking Villas, No. 70, Tin Taw Temple Rd., Hong Kong, Hong Kong

Filed Aug. 30, 1983, Ser. No. 527,685

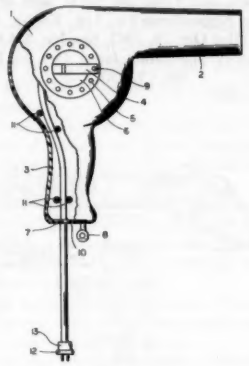
Int. Cl.[3] **A45D** *20/12*

U.S. Cl. 219—370 **6 Claims**

1. In a hand held hot air dryer comprising a housing having a nozzle portion, a handle portion and a central portion therebetween, a motor within said central portion and having a rotatable shaft, a fan disposed in said central portion and driven by said shaft of said motor for driving air through said nozzle portion, heater disposed in said nozzle portion for heating air blown by said fan prior to exit through an opening in said nozzle portion, and electric cord connected to said motor and said heater; the improvement comprising

a rotatable cylindrical reel completely disposed within said central portion of said housing and about said motor and having an axis coaxial with said shaft for retracting and storing in a wound up condition said electric cord, said reel being located outside of the path of air driven by said fan;

a crank connected to said reel for manually winding up said reel thereby to wind up said electric cord, said crank being



disposed outside of said central portion of said housing; and

locking means for holding said reel at different positions.

4,528,441

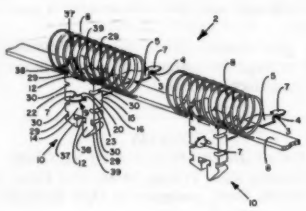
ELECTRICAL RESISTANCE HEATING ASSEMBLY

Douglas T. Seal, Strawberry Plains, and Charles A. Haynes, Seymour, both of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,264

Int. Cl.[3] H05B *3/06*

U.S. Cl. 219—532 **6 Claims**



1. An electrical resistance heating assembly comprising:

an electrical resistance heating coil;

a mounting bar;

at least one electrical insulator connected to the mounting bar and supporting the electrical resistance heating coil, said electrical insulator comprising a slab of electrically insulating material having generally flat parallel opposed front and back surfaces and having at least one end surface generally perpendicular to the front and back surfaces, a first and second arm mounted on and extending outwardly away from said at least one end surface, said first and second arms are configured relative to each other to form an inverted generally T-shaped opening between the arms for engaging and retaining loops of the electrical resistance heating coil, each of said arms having first substantially vertical inside surfaces forming the leg of the T-shaped opening for engaging and compressing loops of the electrical resistance heating coil during mounting of the coil on the arms of the electrical insulator and second substantially vertical surfaces forming the outer portion of the cross bar of the T-shaped opening for retaining loops of the electrical resistance heating coil;

said first arm having a top part with a generally triangular cross section in a plane parallel to the front and back surfaces of the slab of electrically insulating material, with one leg of the triangular top part defining one of the first substantially vertical inside surfaces which form the leg of the T-shaped opening and with the hypotenuse of the triangular top part defining a cam surface for spreading a coil loop of the electrical resistance heating coil when the coil is mounted on the slab of electrically insulating material;

said second arm spaced from the first arm and also having a top part with a generally triangular cross section in a plane parallel to the front and back surfaces of the slab of electrically insulating material, with one leg of the triangular top part of the second arm defining the other first substantially vertical inside surface which forms the leg of the T-shaped opening and with this leg of the triangular top part of the second arm extending outward away from the end surface of the slab of electrically insulating material a distance, greater than the distance that the opposing leg of the triangular top part of the first arm extends outward away from the end surface, to form a stop surface against which the electrical resistance heating coil may be compressed during mounting of the coil on the first and second arms, and with the hypotenuse of the triangular top part of the second arm forming a cam surface for spreading a coil loop of the electrical resistance heating coil when the coil is mounted on the slab of electrically insulating material; and

means for securing the electrical insulator to the mounting bar.

4,528,442

PERSONAL IDENTIFICATION SYSTEM

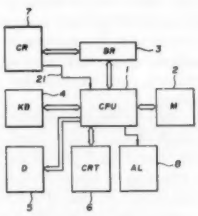
Kimikazu Endo, Kyoto, Japan, assignor to Omron Tateisi Electronics, Co., Kyoto, Japan

Continuation of Ser. No. 451,234, Dec. 20, 1982,. This application May 25, 1984, Ser. No. 614,387

Claims priority, application Japan, Feb. 2, 1982, 57-16050; Dec. 23, 1982, 56-215535; Dec. 23, 1982, 56-215536

Int. Cl.[3] G06F *15/30*

U.S. Cl. 235—379 **12 Claims**



1. A personal identification system comprising a card information store unit for writing therein questions and answers in a card itself or a card information store file separately provided during card input, display means for displaying the contents of questions written in said card information store unit, input means for entering the answers to a question displayed, and control means, said control means being capable of comparing an answer entered for the question displayed by said display means to an answer stored in said card information store unit, capable of making the use of said card effective upon coincidence of said answers with the each other.

4,528,443

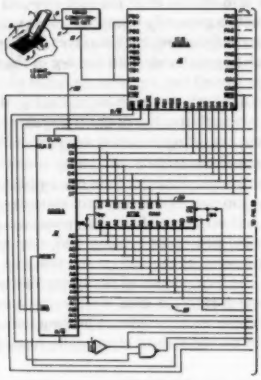
BAR CODE READING SYSTEM AND METHOD

Robert E. Smith, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 370,373, Apr. 21, 1982, Pat. No. 4,438,327. This application Mar. 2, 1984, Ser. No. 585,365

Int. Cl.³ G06K 7/10

U.S. Cl. 235—462 **20 Claims**



1. A method of reading bar coded information, said method comprising the steps of:

(a) producing an analog signal in response to scanning of the bar coded information, said analog signal including signals representative of intensity of radiation emanating from bars and spaces of the bar coded information, the widths of said bars and spaces being representative of whether said bars and spaces represent first or second logical states;

(b) amplifying and shaping said analog signal to produce a new data signal including a plurality of pulses, the duration of consecutive ones of said pulses corresponding to the widths of consecutive bars, respectively, of said bar coded information, the durations of consecutive intervals between said pulses corresponding to widths of consecutive ones of said spaces, respectively, said bar coded information including at least one character including a plurality of said bars and spaces;

(c) measuring the durations of each of a plurality of said pulses and intervals of at least said one character of said bar coded information to produce a plurality of digital duration numbers representative of said plurality of durations, respectively, and storing said plurality of digital duration numbers;

(d) computing a first reference number;

(e) comparing each of said digital duration numbers to said first reference number and producing a first binary number having a plurality of bits corresponding, respectively, to the bars and spaces of said character, each of said bits being equal to said first logical state if a corresponding one of said digital duration numbers is less than said first reference number, each of said bits being equal to said second logical state if a corresponding one of said digital duration numbers is greater than said first reference number;

(f) determining if said first binary number is an acceptable number in accordance with a predetemined criteria, and decoding said first binary number, if it is acceptable, to determine what said character is; and

(g) adjusting the value of said first reference number by a predetermined amount that corresponds to any difference between said first reference number and a value that is an acceptable number in accordance with said predetermined criteria, and repeating steps (e) and (f).

4,528,444

OPTICAL READING APPARATUS WITH AUTOMATIC GAIN CONTROL CIRCUIT

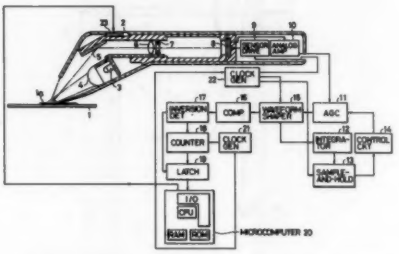
Masahiro Hara, and Toshiyasu Sakai, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 26, 1982, Ser. No. 436,822

Claims priority, application Japan, Oct. 30, 1981, 56-175069

Int. Cl.³ G06K 7/10

U.S. Cl. 235—462 **11 Claims**



1. An optical reading apparatus for converting information which is optically readable by an image sensor into an electrical signal, comprising:

clock generator means for generating first and second pulses, and for applying multiple of said first pulses to said image sensor to thereby enable optical reading of said information, said multiple pulses constituting a scanning operation, and for generating one of said second pulses at the completion of one of said scanning operations;

means for producing from said image sensor said electrical signal;

means, responsive to said generated second pulses, for sampling the voltage amplitude of said electrical signal, and for holding said sampled voltage until a next scanning operation;

automatic gain control circuit means, responsive to said sampled voltage, for automatically controlling the amplitude of said electrical signal.

4,528,445

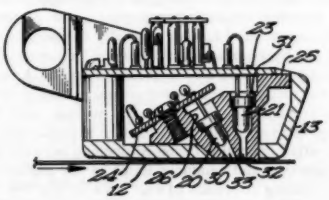
HEAD FOR OPTICAL CARD READER

James A. Willmore, Eden Prairie, Minn., and Henry L. Miszkiewicz, Cardiff, Calif., assignors to Opto Systems Incorporated, San Diego, Calif.

Filed Nov. 3, 1982, Ser. No. 438,938

Int. Cl.³ G06K 7/12

U.S. Cl. 235—469 **6 Claims**



1. An optical card reader comprising:

(a) a card having boundry markable areas that define the readable portions of code arranged in spaced columns and rows;

(b) a card driving mechanism for driving said card over a predetermined path of travel;

(c) a plurality of transversely spaced light sources spatially

disposed from said card and driving mechanism, said light sources directing light towards said card at an angle, at least one light being of a color different than the rest;

(d) a plurality of transversely spaced sensors spatially disposed from said card and driving mechanism, said sensors receiving light reflected normally from said card, at least one sensor receiving light from the color different than the rest, all of said sensors having a state of conducting or non-conducting;

(e) a read head block over which said card is driven having a plurality of transversely spaced first bores, each bore constructed and arranged to receive one of said plurality of light sources,

said block having a plurality of transversely spaced second bores communicating with said first bores, said second bores having parallel sides and converging top and bottom surfaces for converging the light on the markable areas of said card,

said block further having a plurality of transversly spaced third bores, each bore constructed and arranged to receive said plurality of sensors,

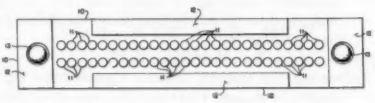
said block also having a plurality of transversely spaced fourth bores, each having four parallel surfaces for collimating the light received from the markable areas of said card, and

(f) a plurality of operational amplifiers, each being connected to said plurality of sensors to be energized thereby when marks on said card are detected by said plurality of sensors.

4,528,446
OPTOELECTRONIC LENS ARRAY WITH AN INTEGRATED CIRCUIT

Thomas J. Dunaway, Minneapolis; Richard K. Spielberger, Maple Grove, both of Minn., and John C. Wittenberger, Littleton, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1982, Ser. No. 393,963
Int Cl.³ H01J *3/14*
U.S. Cl. 250—216 **22 Claims**



1. An integrated circuit optical system, said system comprising:

an electronic integrated circuit device having circuit components therein at least including optoelectronic transducers such that there is at least a plurality of said optoelectronic transducers adjacent a first side of said electronic integrated circuit device;

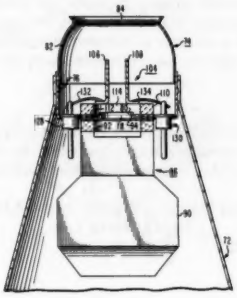
a radiation transmitting material means having at least a plurality of lens portions integrally therein at a first side of said radiation transmitting material means such that electromagnetic radiation transmitted both through a second side of said radiation transmitting material means and through said lens portion is at least in part altered in direction of travel as a result of being transmitted through said lens portion, each said lens portion having an optical axis; and

a bonding means, in addition to said electronic integrated circuit device and said radiation transmitting material means, bonding said radiation transmitting material means at said second side thereof to said integrated circuit device at said first side thereof such that said optical access of each said lens means is substantially centered with respect to a corresponding said optoelectronic transducer so that any deviation from being centered is less than approximately two micrometers.

4,528,447
ELECTROSTATIC SHUTTER TUBE HAVING SUBSTANTIALLY ORTHOGONAL PAIRS OF DEFLECTION PLATES

Robert W. Fitts, Lititz, and Edgar M. Smith, Millersville, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 14, 1983, Ser. No. 513,398
Int. Cl.³ H01J *31/50*
U.S. Cl. 250—213 VT **4 Claims**



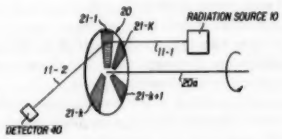
1. In an electrostatic shutter tube comprising source means adapted to emit electrons along a path as an electron image in response to a radiant image incident upon said source means, a phosphor screen spaced from said source means adapted to emit a light image in response to the impingement of said electron image thereon, shuttering means disposed in said electron path between said source means and said phosphor screen to control the emission of said electron image, and an anode member adjacent to said screen having therein a pair of primary deflection plates disposed along said electron path for deflecting said electron image in a first direction across said screen, the improvement wherein

a pair of secondary deflection plates being disposed within said anode member along said electron path in a cross-over region of said electron image, said pair of secondary deflection plates being substantially orthogonal to said pair of primary deflection plates to provide deflection of said electron image in a second direction across said screen, said second direction being different from said first direction.

4,528,448
PLANE LINEAR GRATING FOR OPTICALLY ENCODING INFORMATION

David E. Doggett, Cupertino, Calif., assignor to Benson, Inc., San Jose, Calif.

Filed May 13, 1982, Ser. No. 377,648
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—231 SE **13 Claims**



1. A device for decoding the angular position of a rotating member comprising:

a substrate of material rotatably mountable in a position

other than its center to rotate about a defined axis of rotation in a predetermined relationship to the rotation of said rotating member;

at least one linear diffraction grating formed on or in said substrate;

means for directing incident radiation onto said substrate at a position to impinge upon said at least one linear diffraction grating during rotation of said substrate, whereby at least a portion of said incident radiation is diffracted by said linear diffraction grating through an elongated path during rotation of said substrate;

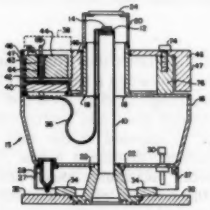
detector means positioned at a discrete location along a segment of said elongated path to receive said diffracted portions of said incident radiation and produce an output signal in response thereto, whereby the angular position of said rotating member is decoded independent of the centration of said axis of rotation through said substrate.

4,528,449

DETECTOR DEWAR ASSEMBLY

William R. Gordon, Burlington, and Peter N. Nicholson, Methuen, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1982, Ser. No. 453,566
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—352 **16 Claims**



1. Detector dewar apparatus for housing an electromagnetic radiation detector assembly in a vacuum, said apparatus providing a means for electrical connection between detector elements of said radiation detector assembly and other signal processing subassemblies external to said apparatus, said apparatus comprising:

A. an inner container having an end surface at a first end of said inner container;

B. an outer container;

C. means for mounting said inner container in said outer container;

D. detector means mounted on said end surface;

E. connector means mounted on said outer container, said connector means providing a plurality of electrical connections from the inside of said outer container to the outside of said outer container while still providing a seal to prevent any significant change in the vacuum which may be contained within said inner and outer containers;

F. electrical connection means for coupling said detector means to said connector means, said electrical connection means located in the space between said inner container and said outer container; and

G. stress relief means comprising

i. at least two stand-offs secured to the outer surface of said outer container near said connector means,

ii. a stress relief connector, and

iii. a stress relief plate having means for securing said stress relief connector, said plate mounted on said stand-offs and wherein said plate is positioned such that it does not contact said outer surface of said outer container and such that it does not contact said connector means, except for the engagement of electrical terminals included in both said connector means and said stress relief connector.

4,528,450

METHOD AND APPARATUS FOR MEASURING RADIOACTIVE DECAY

Robert J. Valenta, Berkeley, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Sep. 10, 1982, Ser. No. 416,779
Int. Cl.³ G01T *1/20*
U.S. Cl. 250—362 **4 Claims**

1. A radiation assay instrument comprising:

a solid scintillator for providing pulses of photons in response to interaction with radiation;

photomultiplier tube means to receive the photons from the scintillator and provide an electric output signal;

reflector means for collecting photons from the scintillator which would not otherwise directly impinge on the photomultiplier tube face and for redirecting them into the photomultiplier tube face; and

circuitry having two parallel electric paths and including,

along a first of the parallel electric paths

integrator means for changing the profile of the electric output signal provided by the photomultiplier tube to a smooth contour signal,

along a second of the parallel electric paths

differentiator means for reducing each electric output signal provided by the photomultiplier tube to a sequence of component photon response pulses which comprise the electric output signal, and

burst identifier means for

interrogating the sequence of component photon response pulses, and

providing an enable signal for each occurrence of a sequence consisting of more than one component photon response pulses that occur within a specified time interval and

pulse height analyzation means for

receiving the smooth contour signals from the pulse integrator means, receiving the enable signals from the burst identifier, and

providing an output count signal for each occurrence of an enable signal and a corresponding smooth contour signal whose pulse height satisfies specified amplitude requirements.

4,528,451

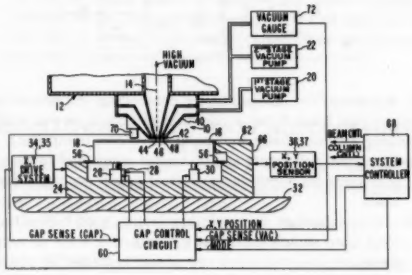
GAP CONTROL SYSTEM FOR LOCALIZED VACUUM PROCESSING

Paul F. Petric, Swampscott; Michael S. Foley; Mark W. Utlaut, both of Beverly, and Joseph A. Laiacano, Gloucester, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 19, 1982, Ser. No. 435,177
Int. Cl.³ H01J *37/18, 37/20, 33/02*
U.S. Cl. 250—441.1 **28 Claims**

1. Charged particle beam lithography apparatus for treating a semiconductor wafer or mask workpiece surface comprising a vacuum envelope having an aperture, a charged particle beam source located in the vacuum envelope for deriving a charged particle beam that is directed through the aperture as a treating beam for the workpiece surface, means for maintaining only a portion of the workpiece surface in approximate registration with the aperture in a vacuum such that the beam can propagate from the source to the workpiece surface por-

tion exclusively in a vacuum, said maintaining means including: (a) means for holding the workpiece so that all of the workpiece, except said workpiece surface portion, is in an ambient environment not subjected to the vacuum; (b) means for preventing contact between the envelope and the workpiece so that a gap is formed between the workpiece surface and the envelope whereby the workpiece surface can move generally transversely of the beam propagation direction to enable different portions of the workpiece surface to be treated in vacuo by the beam at differing times, and (c) vacuum pump



means forming a vacuum seal in the gap for minimizing degradation of the vacuum through the gap; and said means for preventing contact including feedback means for controlling the length of the gap to a predetermined range without contacting the workpiece, said feedback means including: means for sensing the length of the gap, and means responsive to a comparison of a gap length indicating signal derived by the sensing means and a set point value for gap length for dynamically controlling the gap length so it is within the predetermined range.

4,528,452

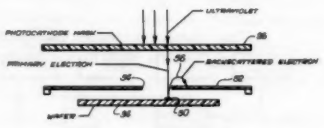
ALIGNMENT AND DETECTION SYSTEM FOR ELECTRON IMAGE PROJECTORS

William R. Livesay, San Diego, Calif., assignor to Electron Beam Corporation, San Diego, Calif.

Filed Dec. 9, 1982, Ser. No. 448,357

Int. Cl.³ H01J *37/304*

U.S. Cl. 250—491.1 **17 Claims**



1. Alignment apparatus for use in an electron image projection system having a mask bearing patterns in a plurality of separate subfield areas, means for supporting a semiconductor wafer on which a like plurality of subfield areas are to be exposed to bombardment of electrons in patterns corresponding to the mask patterns, means for generating a magnetic field between the mask and the wafer to move the electron patterns relative to the wafer, and means for applying an electric field between the mask and the wafer to accelerate electrons in the desired pattern from the mask toward the wafer, the electric field extending all the way to the wafer, the electric field and the magnetic field both occupying substantially the same space, said alignment apparatus comprising:

a plurality of alignment marks disposed on the wafer around each of the subfield areas thereof;

a plurality of corresponding alignment features in the mask pattern, to produce an alignment pattern of electrons for registration with said alignment marks; and

detection means disposed in an equipotential plane between the wafer and the mask, and having at least one opening therethrough for the passage of primary electrons toward the wafer and the return of backscattered electrons emanating from said alignment marks.

4,528,453

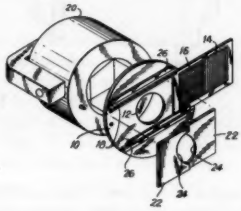
DUAL COLLIMATOR

Sherman L. Heller, Ardsley, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,804

Int. Cl.³ G21K *1/02*

U.S. Cl. 250—505.1 **4 Claims**



1. Apparatus for use with a gamma camera for permitting first the identification of an anatomical area of interest and then the study of the identified area without requiring movement of either the camera or the identified area, comprising a first high resolution collimator section for identifying an area of interest, a second high sensitivity collimator section for study of the identified area, the first and second collimator sections joined to each other at one end, means located between the camera and the area of interest for permitting communication of the camera with the area of interest, including means for receiving the joined first and second collimator sections and for permitting sliding movement of the joined sections to permit positioning of either the first or the second collimator section between the camera and the area of interest thereby allowing first the identification of the area of interest and then the study of the identified area without requiring movement of either the camera or the identified area.

4,528,454

RADIATION-SHIELDING TRANSPORT AND STORAGE CONTAINER

Henning Baatz; Dieter Ritsscher, both of Essen, and Jürgen Wriegt, Heiligenhaus, all of Fed. Rep. of Germany, assignors to GNS Gesellschaft fur Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,627

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010493

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **4 Claims**

1. A container for the storage and transportation and radioactive material comprising:

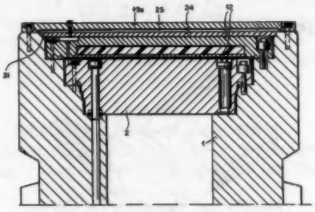
an elongated vessel receiving said material and having a wall thickness and composition attenuating radioactive transmission therefrom, said vessel having an open end formed with an annular thickened portion defining a mouth communicating with the interior of said vessel;

a radiation-shielding cover received in said mouth and having a plug-forming portion juxtaposed with a complementary seat-forming portion of said vessel at said mouth, and a flange extending outwardly from said plug-forming

portion, said vessel being provided with a wall bore communicating at one end with the interior of said vessel and open at its opposite end, said radiation-shielding cover extending outwardly beyond said wall bore, said radiation-shielding cover being provided with a connecting bore registering with said wall bore;

an obturating element received in said connecting bore and adapted to block said wall bore;

a further cover secured directly to said vessel outwardly of said radiation-shielding cover and overlying said wall bore and said radiation-shielding cover, said radiation-shielding cover being formed with at least one control



bore in the region of said seat-forming portion and covered by said further cover, said further cover defining with said radiation-shielding cover a control compartment into which said control bore and said connecting bore open and provided with means whereby the sealing effectiveness of said radiation-shielding cover can be monitored; said vessel being provided with a recess, said further cover being received in said recess against a shoulder formed by said vessel outwardly of said radiation-shielding cover; and

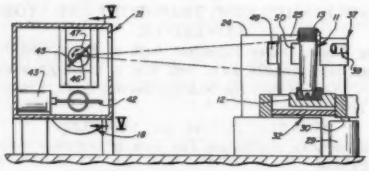
another cover lying outwardly of said further cover and at least partly received in said recess.

4,528,455

NON-DESTRUCTIVE TESTING SYSTEM WITH DUAL SCANNING

Timothy C. Loose, Chicago, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed May 13, 1983, Ser. No. 494,117
Int. Cl.³ G01N *21/88*
U.S. Cl. 250—563 **18 Claims**



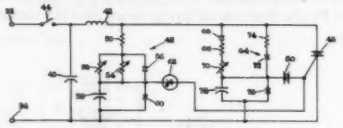
1. In a system for non-destructive testing of a part to indicate defects therein, scanning means operative to scan a region of the part and to develop electrical signals in response to both defects which are in stationary relation to the part and extraneous elements which are movable relative to the part, means for operating said scanning means to sequentially perform first and second scans of said region, comparison means for comparing electrical signals developed during said first and second scans to develop output signals only when electrical signals are developed from the same portions of said region during both of said first and second scans, and displacement means operative between said first and second scans to effect movement of said extraneous elements relative to said part to preclude development of output signals therefrom.

4,528,456

DUAL LOAD CONTROL CIRCUIT

Dewey L. Harris, Coventry, R.I., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1983, Ser. No. 544,022
Int. Cl.³ H02J *3/2*; H02P *7/00*
U.S. Cl. 307—31 **10 Claims**



1. Apparatus for independently controlling the power supplied to two loads from a common electrical power source supplying a substantially sinusoidal waveform comprising:

bidirectional solid state switch means connected to each of said loads for supplying electrical power to each of said loads;

first trigger circuit means for activating said bidirectional solid state switch means to a conductive state to supply electrical power to a first one of said loads during positive half-wave cycles; said first trigger circuit means including means for electrically isolating said first trigger circuit means from said solid state switch means during negative half-wave cycles; and

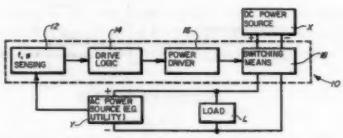
second trigger circuit means for activating said bidirectional solid state switch means to a conductive state to supply electrical power to a second one of said loads during said negative half-wave cycles; said second trigger circuit means including means for electrically isolating said second trigger circuit means from said solid state switch means during said positive half-wave cycles.

4,528,457

DC-AC CONVERTER FOR SUPPLEMENTING AN AC POWER SOURCE

Donald J. Keefe, 1531 Portesuello Ave., Santa Barbara, Calif. 93105, and Oscar D. Despe, R.R. 4, Box 290, Lockport, Ill. 60441

Filed Feb. 28, 1983, Ser. No. 470,152
Int. Cl.³ H02J *3/44*
U.S. Cl. 307—46 **9 Claims**



8. A DC-AC converter for supplying power from a DC power source to supplement a load circuit that is also supplied power by an AC power source, comprising:

switching means operatively connected between the DC power source and the load circuit and controllable to apply the DC power source to the load circuit in either polarity; and

means for synchronizing the operation of the switching means so that the DC power source is applied to the load circuit with alternating polarity at the frequency of the AC power source;

wherein the synchronizing means includes a logic circuit having:

comparator means to generate a first signal train of control pulses wherein a control pulse is generated during each

positive half cycle of the AC power source for substantially the duration of the positive half cycle;

a pulse shaper circuit means to generate a second signal train of pulses wherein the pulses thereof substantially temporally occur at the zero crossings of the AC power source;

a delay circuit means that receives the first and second signals and produces a third signal train of pulses, each of the latter pulses commencing a predetermined time delay after the occurrence of a zero crossing and terminating a predetermined time after its commencement; and

logic means to form control signals from the first and third signals wherein the control signals regulate the operation of the switching means so that the DC power source is applied to the load circuit during each half cycle of the AC power source for a predetermined time which is less than the duration of the half cycle.

4,528,458

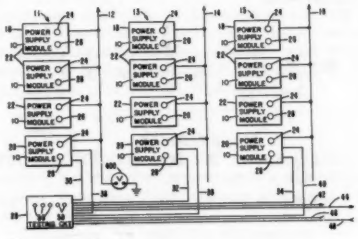
SELF-DIAGNOSTIC REDUNDANT MODULAR POWER SUPPLY

Hilding E. Nelson, Scandia; Myron A. Nesdahl, Coon Rapids, and Marvin L. Gallati, Cambridge, all of Minn., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 6, 1984, Ser. No. 568,968

Int. Cl.³ H02J *1/10*

U.S. Cl. 307—64 **18 Claims**



7. A testing circuit for testing the modules of a voltage deck in a redundant modular power supply having worker modules and a redundant module, said testing circuit comprising:

counting means for sequentially conducting a worker module test and a redundant module test;

output means responsive to said counting means and having an output terminal for connection to the redundant module, said output means placing a command on said output terminal instructing the redundant module to output current during said redundant module test;

input means having an input terminal for receiving a signal from said power supply indicating the output of said power supply; and

fault determining means responsive to said counting means and said input means for determining a fault in said redundant power supply dependent upon the instruction on said output terminal and the signal on said input terminal.

4,528,459

BATTERY BACKUP POWER SWITCH

Roger E. Wiegel, Toddville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 10, 1983, Ser. No. 503,215

Int. Cl.³ H02J *9/06*

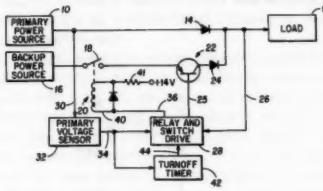
U.S. Cl. 307—66 **7 Claims**

1. A power changeover circuit for connecting a backup power source to a load upon loss of a primary power source, comprising:

a voltage sensor circuit connected to said primary power source, said voltage sensor circuit for generating a first output signal when primary power is enabled and a second output signal when primary power is disabled;

a first switch coupled in series between said backup power source and said load;

a first switch-actuating circuit responsive to said first output signal of said voltage sensor circuit for closing said first switch and coupled thereto;



a second switch coupled in series with said first switch between said backup power source and said load, said second switch having an actuation time significantly faster than said first switch; and

a second switch-actuating circuit responsive to said second output signal of said voltage sensor circuit and coupled thereto for closing said second switch.

4,528,460

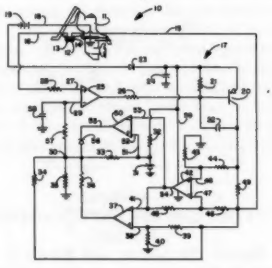
CATHODIC PROTECTION CONTROLLER

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 23, 1982, Ser. No. 452,581

Int. Cl.³ H01B *7/28*

U.S. Cl. 307—95 **5 Claims**



1. A current supply system for connection to an anode and a reference to supply current to said anode to protect a submersible metal unit from corrosion, said current supply system comprising:

(A) an electrical power source;

(B) a current controller to control the electrical current supplied to said anode, said current controller and said power source connected in series between said submersible metal unit and said anode;

(C) an amplifier connected between said reference electrode and said current controller to operate said current controller in response to the potential of said reference electrode;

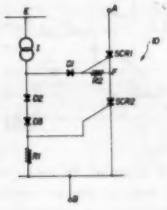
(D) a bias network connected between said amplifier and said anode to provide a bias signal to said amplifier, said bias signal increasing as the current supplied to said anode increases to compensate for the voltage drop between said anode and said reference electrode; and

(E) a voltage reference connected to said bias network to establish a minimum bias level supplied by said bias network to said amplifier.

4,528,461
INTEGRATED CIRCUIT SWITCH USING STACKED SCRS

Peter W. Shackle, Melbourne, and Robert S. Pospisil, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 3, 1982, Ser. No. 414,862
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 L **14 Claims**



1. An integrated circuit switch for interconnecting a pair of points in a circuit comprising:

a first and second terminal for connecting to said pair of points in a circuit;

first and second thyristors having main electrodes serially connected to one another and said first thyristor having a main electrode connected to said first terminal and said second thyristor having a main electrode connected to said second terminal;

a third terminal for receiving a biasing potential;

a first diode means connecting said third terminal to the gate of said first thyristor for gating said first thyristor on by said biasing potential;

a second diode means connecting said third terminal to the gate of said second thyristor for gating said second thyristor on by said biasing potential;

when a voltage less than the sum of the breakdown voltage of both of said first and second thyristors is applied across the first and second terminals and said biasing potential is applied to said third terminal, said second thyristor is gated on via said second diode means thereby enabling said first thyristor to be gated on via said first diode means.

4,528,462
INTEGRATED CIRCUIT SWITCH USING STACKED SCRS

Peter W. Shackle, Melbourne, and Robert S. Pospisil, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 414,862, Sep. 9, 1982,. This application Jan. 21, 1983, Ser. No. 460,020
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 L **9 Claims**

1. An integrated circuit switch for interconnecting a pair of points in a circuit comprising:

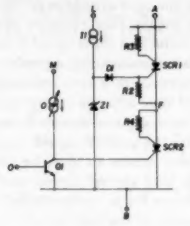
a first and second terminal for connecting to said pair of points in a circuit;

first and second thyristors having main electrodes serially connected to one another, said first thyristor having a main electrode connected to said first terminal and said second thyristor having a main electrode connected to said second terminal;

a switchable means connected to the gate of said second thyristor and having a first and second state in response to a switching signal for gating said second thyristor on in said first state and for maintaining said second thyristor off in said second state;

a third terminal for receiving a biasing potential;

a first diode means connecting said third terminal to the gate of said first thyristor for becoming forward biased and gating said first thyristor on by said biasing potential when a voltage less than the sum of a breakdown voltage of said

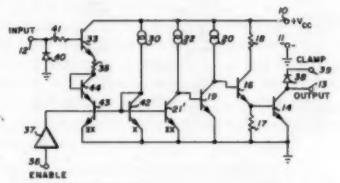


first and second thyristors is applied across the first and second terminals and said second thyristor is gated on.

4,528,463
BIPOLAR DIGITAL PERIPHERAL DRIVER TRANSISTOR CIRCUIT

David Kung, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 30, 1982, Ser. No. 394,028
Int. Cl.³ H03K *3/01*
U.S. Cl. 307—270 **4 Claims**



1. An integrated digital peripheral driver circuit comprising:

an output stage capable of sinking relatively large values of current;

driver means having an input responsive to an input signal for turning said output stage on and off;

input means for supplying a signal for turning said driver means on and off comprising:

first current mirror means having an input and an output coupled to said input of said driver means;

second current mirror means having an input and an output coupled to said input of said first current mirror; and

an input stage connected as an emitter follower coupled to drive said input of said second current mirror.

4,528,464
DEGENERATE FOUR-WAVE MIXER USING MULTIPLE QUANTUM WELL STRUCTURES

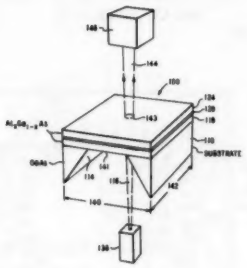
Daniel S. Chemla, Rumson; David A. B. Miller, Lincroft, and Peter W. Smith, Colts Neck, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1983, Ser. No. 470,319
Int. Cl.³ G02F *2/00;* **H03F** *7/00*
U.S. Cl. 307—425 **27 Claims**

1. A four-wave mixer comprising:

a multiple quantum well (MQW) structure including a multiple layer heterostructure made from alternate layers of a charge carrier semiconductor material having a narrow bandgap energy, and a charge barrier material having a wider bandgap energy than said charge carrier material, said layers deposited one upon the other in substantially flat planes forming a series of potential barriers which result from the bandgap energy difference between said

narrow and said wider bandgap energy, said potential barriers being oriented in the direction perpendicular to said layers and capable of confining charge carriers which arise within said layers of said charge carrier semiconductor material to remain substantially therein, and an optical absorption coefficient of said multiple layer heterostructure exhibits at least one sharp resonant optical absorption peak near said semiconductor material bandgap absorption;



means for providing a first beam of light which propagates through said MQW structure; and

means for providing a second beam of light which propagates through said MQW structure and substantially overlaps said first beam of light within said MQW structure so that at least one output phase conjugate beam of light is produced by interaction of said first and said second beams of light with said MQW structure.

4,528,465

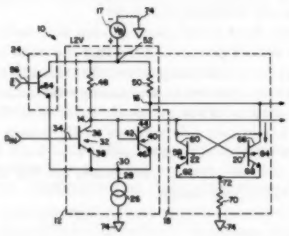
SEMICONDUCTOR CIRCUIT ALTERNATELY OPERATIVE AS A DATA LATCH AND A LOGIC GATE

Barry Harvey, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 15, 1982, Ser. No. 441,457

Int. Cl.³ H03K *3/023, 3/037, 3/295, 19/086*

U.S. Cl. 307—454 **8 Claims**



1. A data latch circuit comprising:

a common voltage node coupled to a first source of potential;

a logic gate element having a first common current node coupled to a first current element, said first current element also being coupled to a second source of potential; said logic gate element also having a first input means and a second input means, and having an output means, said output means having a first load and a second load said first load and said second load being coupled together to said common voltage node, said logic gate element also having a first common terminal and a second common terminal coupled together at said common current node to said first current element;

a storage element having a first input terminal coupled through said first load to said common voltage node, and having a second input terminal coupled through said second load to said common voltage node, said storage element also having a resistor, said resistor having one terminal coupled to a second common current node, and another terminal coupled to said second source of potential, said storage element also having a third common terminal and a fourth common terminal coupled together to said second common current node, said second source of potential being at a differential relative to said first source of potential; and

a selection element having a switch means coupled between said common voltage node and said first common current node, said switch means having a control input terminal for controlling the opening and closing of said switch means in response to a binary logic level selection signal, such that when said switch means is open, said selection element is in a first selection control state, and when said switch means is closed, said selection element is in a second selection control state;

wherein said data latch circuit is operative as a gate in said first selection control state and as a data latch in said second selection control state.

4,528,466

COMPONENTS FOR POLYPHASE LINEAR MOTORS

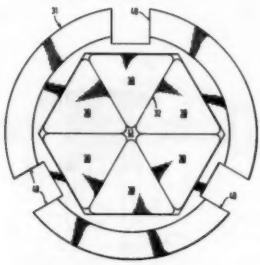
Johann von der Heide, Mönchweiler, and Georg Papst, St. Georgen, both of Fed. Rep. of Germany, assignors to Papst Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,134

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912532; Sep. 28, 1979, 2939445

Int. Cl.³ H02K *41/02*

U.S. Cl. 310—12 **12 Claims**



1. An improved internal flux-conducting member for use in linear motors, comprising an elongated electrically conductive element with an axis and assembled of a plurality of separate elongated rods having abutting surfaces, said abutting surfaces extending essentially radially outwardly from an interior of the member to an exterior thereof and forming at least one axially elongated and radially extending electrical discontinuity which is so situated that circumferential eddy currents within the element are prevented from flowing in paths which are circular as viewed along the axis.

4,528,467

COIL FOR DISK FILE ACTUATOR

Willi E. Huebner, and Joseph P. Niemerg, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

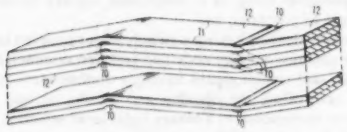
Filed Sep. 19, 1983, Ser. No. 533,830

Int. Cl.³ H02K *41/02*

U.S. Cl. 310—13 **6 Claims**

1. In a voice coil actuator having a magnet assembly includ-

ing an air gap, the inner surface of which is defined by a center pole piece of said magnet assembly, and a coil mounted for axial movement in said air gap in response to current in said coil reacting with the magnetic flux in said air gap, an improved coil comprising an insulated ribbon type wire having a plurality of knurl prints extending in a direction transverse to the length of said wire, said wire being wound edgewise to



form a multi-turn coil, and a bonding agent disposed on the flat planar sides of said wire to bond adjacent turns together, whereby the knurl prints on the wound wire are disposed in a generally radial direction relative to the axis of said coil and define a plurality of radially extending vents in said coil to avoid entrapping volatile constituents of said bonding agent or said insulation.

4,528,468

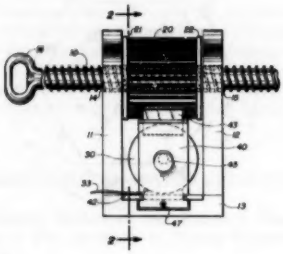
DIGITAL LINEAR ACTUATOR

Charles W. Leubecker, P.O. Box 34, Fawn Grove, Pa. 17321

Filed Dec. 27, 1983, Ser. No. 565,644

Int. Cl.³ H02K *33/00*

U.S. Cl. 310—21 **5 Claims**



1. A digital linear actuator comprising

an externally threaded shaft;

a frame supporting the shaft for linear motion, the frame comprising a base and two parallel arms extending from opposite sides of the base, the shaft being supported by the arms;

means preventing the shaft from rotating;

an internally threaded generally cylindrical rotor threaded on the shaft and positioned between and closely spaced from the arms, whereby the frame and rotor act substantially as a unit with respect to linear movement by the shaft, the circumference of the rotor having adjacent equaly sized teeth formed therearound, each tooth running parallel to the shaft; and

drive means spaced from the rotor and operative in response to a pulse of electric current to engage the toothed circumference of the rotor and turn the rotor through a predetermined arc, whereby the shaft undergoes an increment of linear translation relative to the rotor.

4,528,469

COMPACT A.C. MACHINE HAVING PLURAL VENTILATION DUCTS

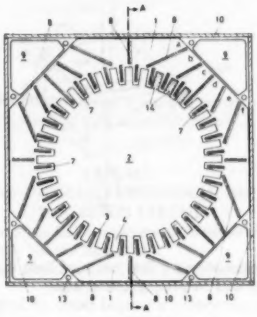
Herbert Prenner, Windisch; Urban Ulrich, Fislisbach; Max Voser, Scherz, and Beat Zimmerli, Lupfig, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 29, 1984, Ser. No. 584,632

Claims priority, application Switzerland, Mar. 10, 1983, 1305/83

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—59 **10 Claims**



1. An alternating current machine comprising:

a rectangular casing having four side walls and two end plates; and

a stator sheet metal body mounted in said casing and surrounded thereby on all sides of said stator sheet metal body,

said stator sheet metal body comprising,

a stator bore and plural partial sheet metal packs each including plural individual sheets stacked one against another,

each said pack having at least six sides defining a peripheral polygonal contour and separated from an adjacent of said packs by means of distance elements defining radial ventilation dusts between said packs,

said partial sheet metal packs having side surfaces and arranged behind one another so that the pack side surfaces run parallel to the casing side walls and are in contact with at least two opposed of said casing side walls,

the side surfaces of the stator sheet metal body which directly adjoin said side surfaces of the stator sheet metal body in contact with said casing side walls defining together with said casing walls axially running corner ducts in corners of said casing,

said axially running corner ducts communicating freely with the radial ventilation ducts between the partial sheet metal packs to provide a connection between the stator bore and said axially running corner ducts,

axially disposed clamping means for clamping the entire stator sheet metal body together in the axial direction,

said clamping means being in contact with said end plates and each of said casing side walls and disposed outside of an inscribed circle, which is inscribed in said sheet metal body contour such that said clamping means is disposed outside the electrically and magnetically active stator sheet metal body,

said distance elements including distance elements remote from the stator bore and which are directed in the direction towards the ventilation ducts in the casing corners, and

said end plates comprising openings which connect the cooling ducts in the casing corners with the outside space.

4,528,470
STARTER MOTOR INCORPORATING AN EPICYCLIC REDUCTION GEAR MECHANISM

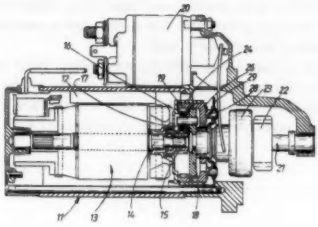
Donald A. Young, Sutton Coldfield, and Ronald Wilson, Birmingham, both of England, assignors to Lucas Industries, Birmingham, England

Filed May 15, 1984, Ser. No. 610,561

Claims priority, application United Kingdom, May 27, 1983, 8314793

Int. Cl.³ H02K *7/10*; F16H *1/28*

U.S. Cl. 310—78 **8 Claims**



1. In a starter motor including a housing, an electric motor, an epicyclic reduction gear mechanism within the housing driven by the electric motor and having an output member and a pinion gear wheel driven from the output member, the improvement comprising:

the output member of the epicyclic gear mechanism is a planetary gear carrier connected to the pinion gear wheel and having planetary gears rotatably mounted thereon;

an annular gear operatively engaging said planetary gears and rotatably mounted in the housing; and

torque limiting clutch means for releasably restraining said annular gear against rotation relative to the housing;

so that when said annular gear is subjected to a torque in the direction opposite to that to which it is subjected during normal cranking of an associated engine, and in excess of a predetermined value, said clutch means releases said annular gear to allow said annular gear to slip thereby limiting the torque to which the epicyclic gear mechanism and remainder of the starter motor drive train is subjected.

4,528,471
POSITIONING SENSOR

Heinrich Baumann, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 241,058, Mar. 6, 1981, abandoned. This application Jun. 24, 1983, Ser. No. 507,949

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011822

Int. Cl.³ H02K *19/24*

U.S. Cl. 310—11 **7 Claims**

1. Positioning sensor system to provide a plurality of electrical output signals representative of rotational speed of an automative starter gear for an internal combustion engine, and which is capable of transmitting rotary power to the engine, and an additional reference signal representative of the instant when the starter gear (4) has a predetermined angular position,

said starter gear having a plurality of projecting teeth (14, 18), all of which are spaced from each other by uniform tooth gaps, and are of uniform pitch, so as to mesh with another mating gear, all of said teeth of said starter gear transferring power between said mating gear,

said system further comprising a single electromagnetic inductive pick-up element (10, 12) positioned in magnetically coupled relation to the teeth of said starter gear,

wherein the major number of teeth of said plurality of uniformly spaced teeth is of uniform shape and size, and

at least one tooth (15, 17) being of reduced or lesser height (H1) over a portion (B1) of its axial dimension or width with respect to the teeth of uniform shape and size,

to induce, during rotation of the starter gear, (i) uniformly similar electrical signals in the single inductive pickup element upon passage of said major number of teeth past the single inductive pickup element, and (ii) the additional reference signal in the inductive pickup element upon passage of said at least one tooth past said single electromagnetic inductive pick-up element, said additional reference signal being of different electrical characteristic from said uniformly similar electrical signals.

4,528,472
POLE-CHANGING THREE-PHASE WINDING FOR OPTIONAL, FRACTIONAL POLE-PAIR RATIOS

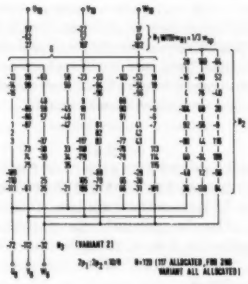
Herbert Auinger, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 508,790

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225253

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—198 **3 Claims**



1. A pole-changing three-phase winding with base-speed winding branches G effective in both pole-number steps of which one third each is allocated to all three winding phases and to N dead branches effective only with one number of pole-pairs each, so that the distribution of the winding coils into equal-phase winding branches per phase is carried out for the first pole-pair number p_1 according to

$$G + N = \frac{2p_1}{t}$$

where t is an integer divisor of p_1 and G is divisible by three, characterized by the fact that for optional, fractional pole-pair ratios with pole-pair numbers not divisible by three, in each case, for the selected first pole-pair number p_1, when the coils are distributed to the individual winding branches in each phase, those coils are not taken into consideration which, in the coil side star form overlapping phase bands for the second

pole-pair number p_2 and the remaining coils of each phase for p_1 are distributed in even and symmetrical groupings along the periphery and that at least a portion of these initially omitted coils are planned as additional dead winding branches for the second pole pair number p_2, so that the portion x of the coils, to be taken into consideration for the first pole-pair number is

$$x = \frac{3n}{p_2},$$

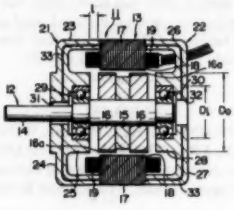
where n=1, 2, 3. . . .

4,528,473

PERMANENT MAGNET TYPE STEP MOTOR

Katsue Tezuka, Ueda, Japan, assignor to Shinano Kenshi Kabushiki Kaisha, Nagano, Japan

Filed Feb. 24, 1984, Ser. No. 583,257
Claims priority, application Japan, Feb. 26, 1983, 58-26554[U]
Int. Cl.³ H02K *1/12*
U.S. Cl. 310—256 **13 Claims**



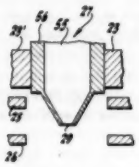
1. A permanent magnet type step motor comprising: a rotor comprised of a disc-like permanent magnet having a magnetic pole in an axial direction thereof and a pair of rotor yokes holding the permanent magnet therebetween such that the rotor and the rotor yokes are integrally and coaxially mounted on a rotational shaft, and a stator having a stator core opposed to an outer circumference of said rotor yokes, said stator being coaxially held with respect to the rotational shaft by front and rear brackets, said front and rear brackets being formed of a non-magnetic material in which a thin magnetic shield sheet is embedded in the interior thickness thereof.

4,528,474

METHOD AND APPARATUS FOR PRODUCING AN ELECTRON BEAM FROM A THERMIONIC CATHODE

Jason J. Kim, 13 Dianne Ct., Lafayette, Calif. 94549

Continuation of Ser. No. 355,267, Mar. 5, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 577,726
Int. Cl.³ H01J *1/14*
U.S. Cl. 313—346 R **39 Claims**



1. Electron beam apparatus comprising:

frustum shaped cathode means composed of a thermoelectron emissive material having a low work function and a high operating temperature to provide a high emission current density, said temperature also causing such material to be highly reactive, said cathode means being a single crystal, having a flat single crystal plane top surface and a conical side surface, said flat single crystal plane top surface providing a high saturation emission current density having a uniform angular emission pattern which is essentially normal to said crystal plane and having a uniform intensity distribution at said operating temperature;

a thin coated layer which covers the side surface of said shaped thermoelectron emissive material and whose material has a high work function so as to provide a low saturation emission current density from said side surface relative to said top surface so that side lobes in said beam are prevented even under full exposure to a positive accelerating field, hardly reacts chemically with said thermoelectron emissive material at said operating temperature, has a high melting point, and has a low vapor pressure at said operating temperature; and

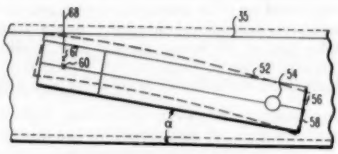
electrode means for producing an electric field at said top surface for providing an emission region of the Schottky or thermal field type where said top surface is exposed fully to positive accelerating potentials of said electrode means.

4,528,475

COLOR PICTURE TUBE HAVING SPRING SUPPORTS FOR A MASK-FRAME ASSEMBLY

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 9, 1983, Ser. No. 492,636
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—405 **4 Claims**



1. In a color picture tube of the type including an evacuated envelope enclosing a cathodoluminescent screen, an electron gun and an apertured mask attached to a frame which is suspended in relation to said screen by support means, an axis passing through the center of said electron gun and the center of said screen being the longitudinal axis of said tube, said screen also including a major axis and a minor axis which are perpendicular to each other and perpendicular to said longitudinal axis, said support means including a plurality of studs embedded in said envelope and spaced around said frame, and a plurality of springs, each of said springs having an aperture at one end for engagement with one of said studs and the other end of each of said springs being attached to said frame at an attachment point the improvement comprising:

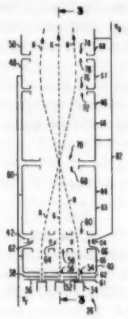
each of said attachment points lying in individual planes parallel to planes containing the longitudinal axis of said tube,

said springs being angled with respect to said frame, the angle between a spring and said frame being of an amount whereby said attachment points remain in said planes when said spring and frame are unheated and when said spring and frame are heated.

4,528,476
CATHODE-RAY TUBE HAVING ELECTRON GUN WITH THREE FOCUS LENSES

Roger T. Alig, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1983, Ser. No. 545,049
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—412 **10 Claims**



1. An inline electron gun for use in a cathode-ray tube, comprising

first electrode means for forming three inline electron beams including a center beam and two outer beams,

second electrode means for prefocusing each of said electron beams individually and for converging said two outer beams toward said center beam to cross-over each other within said electron gun,

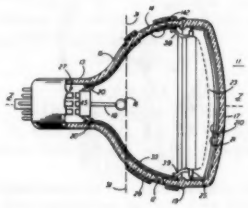
third electrode means for providing a common main focus lens for said three electron beams at the crossover of said beams, and

fourth electrode means for providing a common post-focus lens for said three electron beams which causes said two outer beams to converge with said center beam near a screen of said tube.

4,528,477
CRT WITH OPTICAL WINDOW

Anthony V. Gallaro, Auburn, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,468
Int. Cl.³ H01J *5/10, 31/00*
U.S. Cl. 313—479 **5 Claims**

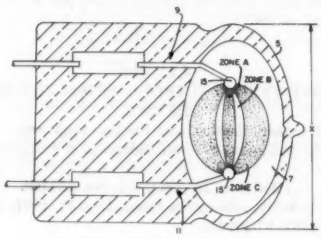


1. In a cathode ray tube having an envelope formed of a sealed integration of neck, funnel and panel portions providing an enclosure for structural components including a multi-electrode electron gun assembly located in said neck portion in a manner to project at least one electron beam to traverse a multi-apertured member and impinge upon a cathodoluminescent screen disposed on the interior surface of said panel, a getter assembly, the funnel portion containing external and internal electrically conductive coatings interrupted in at least one area to define a clear window in the funnel wall; and an adherent electrically conductive, transparent metal oxide layer on the interior surface of the funnel wall completely covering the clear window, and making electrical contact with the internal conductive coating.

4,528,478
SINGLE-ENDED METAL HALIDE DISCHARGE LAMP WITH MINIMAL COLOR SEPARATION

Harold L. Rothwell, Jr., Rowley, and George J. English, Reading, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 9, 1983, Ser. No. 502,775
Int. Cl.³ H01J *61/06, 61/16*
U.S. Cl. 313—631 **6 Claims**



1. A single-ended metal halide discharge lamp comprising:

an elliptical-shaped fused silica envelope having an inner wall portion;

a pair of electrodes sealed into and passing through said envelope, each of said electrodes having a spherical ball on the end thereof within said envelope with said spherical balls spaced from one another along a longitudinal axis:

a gas fill within said envelope including a plurality of gases selected to provide substantially white light at each of a plurality of distances from said longitudinal axis of said spaced spherical balls and said white light at each of said plurality of distances combined to provide white light emission with minimal color separation from said discharge lamp and

a core of first emission zone surrounding said longitudinal axis intermediate said spherical balls, a second emission zone overlapping and surrounding said first zone and a third emission zone overlapping said first and second emission zones and surrounding said second zone and extending to said inner wall portion of said envelope with said gases of said gas fill selected to provide substantially white light from each of said zones.

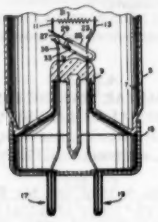
4,528,479
CIRCUIT BREAKER BY-PASS ELEMENT

Robert P. Bonazoli, Hamilton, Mass., and John W. Shaffer, Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 5, 1983, Ser. No. 520,865
Int. Cl.³ H01J *7/44;* **H05B** *41/06*
U.S. Cl. 315—73 **7 Claims**

1. A circuit breaker for a rapid-start fluorescent lamp comprising a sealed glass bottle, a bimetal switch means normally closed at room temperature and open at a predetermined temperature higher than room temperature, a pair of electrical conductors sealed into and passing through said glass bottle and a meltable by-pass element short-circuiting said bimetal switch means, said meltable by-pass element having an electri-

cal resistivity of not less than about 100 ohms/circular mil foot at 20° C. and a temperature coefficient of resistance of not



more than about 1000 microhms per ohm per °C. in the range of about 0° to 100° C.

4,528,480

AC DRIVE TYPE ELECTROLUMINESCENT DISPLAY DEVICE

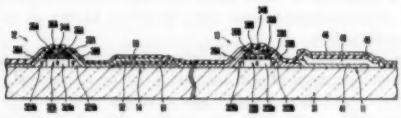
Takashi Unagami, Katsuta, and Bunjiro Tsujiyama, Mito, both of Japan, assignors to Nippon Telegraph & Telephone, Tokyo, Japan

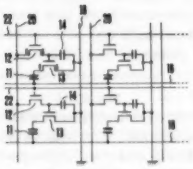
Filed Dec. 28, 1982, Ser. No. 454,008

Claims priority, application Japan, Dec. 28, 1981, 56-215038; Nov. 29, 1982, 57-209123

Int. Cl.³ H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.1 **8 Claims**





1. An AC drive type electroluminescent display device comprising:

first and second thin film transistors formed on first and second portions of one surface of a transparent insulating substrate, each of which includes a first conductivity type channel region, said channel region comprising polycrystalline silicon with its crystal grain size increased, first and second impurity diffused regions of said first conductivity type and contiguously disposed on both sides of said channel region, a silicon gate oxide film formed on said channel region, a gate region overlying said silicon gate oxide film and made of polycrystalline silicon of a second conductivity type, a gate electrode, and first and second output electrodes which are formed on said gate electrode and said first and second impurity diffused regions;

said second transistor including a first offset gate region located between said gate region and said first impurity diffused region and a second offset gate region located between said gate region and said second impurity diffused region, said first and second offset gate regions being located in said polycrystalline channel region of said second transducer;

an electroluminescent element formed on a third portion of said surface of said transparent insulating substrate;

a capacitance element formed on a fourth portion of said surface of said transparent insulating substrate;

means for connecting one electrode of said electroluminescent element to the first output electrode of said second transistor;

means for connecting said second output electrode of said second transistor to a reference line;

means for connecting said gate electrode of said second transistor to said second output electrode of said first transistor;

means for connecting said second output electrode of said first transistor to a scanning line;

means for connecting said first output electrode of said first transistor to a signal line; and

means for connecting the other elements of said electroluminescent element to a source of alternating current.

4,528,481

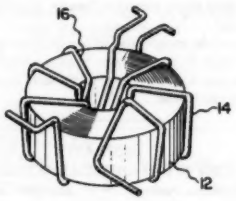
TREATMENT OF AMORPHOUS MAGNETIC ALLOYS TO PRODUCE A WIDE RANGE OF MAGNETIC PROPERTIES

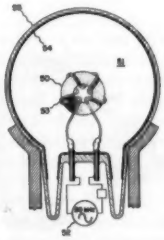
Joseph J. Becker; Fred E. Luborsky; Israel S. Jacobs, and Richard O. McCary, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 201,166, Oct. 27, 1980, abandoned, which is a division of Ser. No. 911,976, Jun. 2, 1978, Pat. No. 4,262,233, which is a division of Ser. No. 719,914, Sep. 2, 1976, Pat. No. 4,116,728. This application Apr. 16, 1984, Ser. No. 600,919

Int. Cl.³ H05B *41/16, 41/25*

U.S. Cl. 315—248 **18 Claims**





1. An improved magnetic core comprising a closed loop body having a generally toroidal shape, said body being formed from a spirally wound ribbon of magnetic amorphous metal alloy, said amorphous metal alloy having a composition which includes iron and boron and which is substantially free of cobalt, with said body having been heated to a temperature sufficient to achieve stress relief of said amorphous metal alloy, said body having been annealed in the presence of a magnetic field.

5. An improved fluorescent lamp of the type including a closed loop magnetic core; a mass of gaseous medium linking

said core and adapted to sustain an electric discharge due to an electric field induced therein by said core; a substantially spherical, evacuable light transmissive envelope containing said mass; means for energizing said core with a radio frequency magnetic field whereby said electric field is induced in said mass; and means for producing visible light in response to said electric dicharge;

wherein, as improvement, said closed loop magnetic core comprises a closed loop body having a generally toroidal shape, said body being formed from spirally wound magnetic amorphous metal alloy, said amorphous metal alloy having a composition which includes iron and boron and which is substantially free of cobalt, with said body having been heated in the presence of a magnetic field to a temperature sufficient to achieve stress relief of said amorphous alloy.

4,528,482

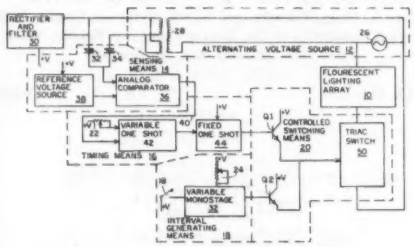
CONTROL OF ENERGY TO FLUORESCENT LIGHTING

Joseph C. Merlo, 22 Wyandotte St., Selden, N.Y. 11784

Filed Jul. 20, 1983, Ser. No. 516,124

Int. Cl.[3] G05F *1/00;* **H05B** *37/02*

U.S. Cl. 315—291 **13 Claims**



1. The method of reducing the energy consumption of fluorescent lighting energized by an alternating voltage source comprising sensing for a particular amplitude of the alternating voltage, upon sensing such voltage amplitude establishing a given time period which is a fraction of a cycle of the alternating voltage, at the end of said given time period actively connecting the alternating voltage source to the fluorescent lighting whereby said lighting is energized for a portion of the cycle, and for a given time interval at the start of operation continuously actively connecting the alternating voltage source to the fluorescent lighting so that the components of the fluorescent lighting can efficiently warm up, said given time interval being controllably variable.

4,528,483

MULTIPLE-SHAFT DRIVE

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst Motoren GmbH & Co. Kg, St. Georgen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 166,092, Jul. 3, 1980, abandoned. This application Jan. 10, 1983, Ser. No. 456,753

Claims priority, application Switzerland, Jul. 17, 1979, 6624/79; Fed. Rep. of Germany, Jul. 5, 1980, 3026679

Int. Cl.[3] H02P *1/54*

U.S. Cl. 318—112 **7 Claims**

1. A multiple-shaft drive unit in which all shafts are synchronized with each other, comprising:

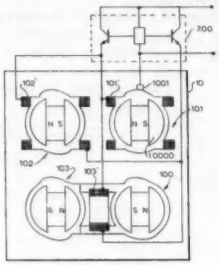
a DC source;

a first commutatorless DC motor with a rotor;.

a position sensor cooperating with the rotor to generate alternating current at a drive frequency of the rotor;

a commutation circuit connected to the position sensor, the DC source and the first motor to commutate DC current from the DC source in synchronism with said drive frequency and thereby operate the first motor;

at least one additional commutatorless DC motor with a rotor, said at least one additional motor being connected



to the commutation circuit in parallel with the first motor; and

a light mechanical coupling linking all the rotors together and synchronizing rotation thereof.

4,528,484

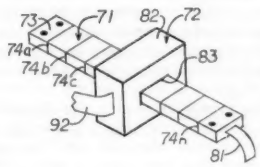
ELECTRONICALLY CONTROLLED MOTOR ASSEMBLY

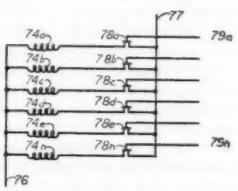
Thomas C. Hansen, 1115 Sir Francis Drake Blvd., Apt. 16, Kentfield, Calif. 94904

Continuation-in-part of Ser. No. 417,222, Sep. 13, 1982,. This application Feb. 16, 1983, Ser. No. 467,137

Int. Cl.[3] H02P *7/06*

U.S. Cl. 318—135 **6 Claims**





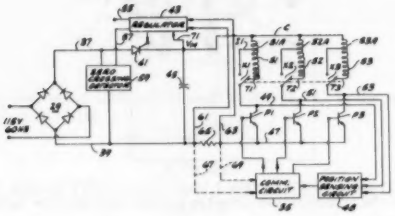
1. In an electronically controlled motor assembly: first and second relatively moveable substrate members, a plurality of spaced apart electrical conductors carried by the first substrate member, an electrical conductor carried by the second substrate member and extending in a direction generally parallel to the conductors carried by the first substrate member, and means for selectively energizing one of the conductors carried by the first substrate member and the conductor carried by the second substrate member to produce interacting magnetic fields which cause the substrate members to assume a predetermined position relative to each other.

4,528,485

ELECTRONICALLY COMMUTATED MOTOR, METHOD OF OPERATING SUCH, CONTROL CIRCUIT, LAUNDRY MACHINE AND DRIVE THEREFOR

John H. Boyd, Jr., Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 13, 1982, Ser. No. 367,951
Int. Cl.³ H02P 7/00; H02K 29/00
U.S. Cl. 318—138 **57 Claims**



1. An electronically commutated motor adapted to be energized from a DC power source in both a high speed mode and a low speed mode through switching means at a current not significantly greater than a preselected level, the motor comprising:

a stator having a multi-stage winding arrangement including a plurality of winding stages, said winding stages each having a plurality of winding turns only a first portion of which is adapted to be electronically commutated in a first preselected sequence when the motor is energized in the high speed mode and a predeterminately greater portion of which is adapted to be electronically commutated in a second preselected sequence different from the first preselected sequence when the motor is energized in the low speed mode, and means for connecting said winding stages to the switching means, the switching means being adapted to change the number of winding turns which are to be electronically commutated; and

a permanent magnet rotor associated with said stator and arranged in selective magnetic coupling relation with said winding stages so as to be rotatably driven thereby, said rotor being rotatably driven in one direction in the high speed mode so as to develop a first torque at the preselected current level when only said first portion of said winding turns of at least some of said winding stages is electronically commutated in the first preselected sequence and said rotor also being rotatably driven in the one direction and another direction opposite thereto in the low speed mode so as to develop a second torque predeterminately greater than the first torque when said predeterminately greater portion of said winding turns of each winding stage is electronically commutated in the second preselected sequence at a current not significantly greater than the preselected level, the ratio of the greater portion of winding turns to the first portion of winding turns being substantially that of the ratio of the second torque to the first torque whereby the motor develops the first torque in the high speed mode and the second predeterminately greater torque in the low speed mode at currents substantially at the preselected level.

48. An electronically commutated motor comprising:

a generally rectangular stator core having first and second pairs of opposite sides with respective adjacent opposite sides of said first and second opposite side pairs generally defining therebetween a plurality of corner sections of said core;

a plurality of first pairs of slots generally of like configuration arranged in said stator core generally adjacent said opposite sides of said first and second opposite side pair, respectively;

a plurality of second pairs of slots generally of like configuration different from the configuration of said first slot pairs and arranged in said stator core generally adjacent said corner sections thereof, respectively;

a multi-stage winding arrangement associated with said stator core including a plurality of winding stages adapted to be electronically commutated in at least one preselected sequence, each of said winding stages comprising at least one coil having a plurality of winding turns formed into a plurality of loops defining opposite side loop portions, one of said opposite side loop portions of said coils in two of said winding stages sharing respective ones of said slots of said first slot pairs and the other of the opposite side loop portions of said coils in said two winding stages sharing respective ones of said slots of said second slot pairs only with side loop portions of another coil in the same winding stage; and

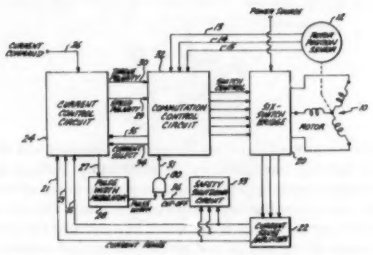
rotatable means associated with said stator core and adapted for selective magnetic coupling engagement with said winding stages upon the electronic commutation thereof in the at least one preselected sequence, said rotatable means including a set of permanent magnetic material elements.

4,528,486

CONTROLLER FOR A BRUSHLESS DC MOTOR

Terrance L. Flaig, Tukwila, and Gavrik Peterson, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1983, Ser. No. 566,588
Int. Cl.³ H02P 6/02
U.S. Cl. 318—254 **21 Claims**



1. A controller for regulating the current applied to the windings of a brushless motor, said motor including a rotor position sensor, said controller comprising:

switching devices for selectively connecting the windings of said motor with a source of electric power;

an error signal circuit for generating an error signal proportional to the difference between a current command signal and a selected operating current through the windings of said motor;

a pulse width modulator circuit, responsive to said error signal, to provide a pulse width signal, said pulse width modulator having a predetermined operating range;

a speed polarity circuit to provide a speed polarity signal in response to said error signal and in accordance with the operating range of said pulse width modulator;

a safety shutdown circuit connected to sense the operating currents through the windings of said motor and provide a cut-off signal when any one of said currents exceeds a predetermined upper level, said cut-off signal being provided until said current is sensed to fall to a predetermined lower level;

a commutation control circuit for controlling the switching devices in response to said pulse width signal, said error signal, said speed polarity signal, and a rotor position signal received from the rotor position sensor, said commutation control circuit being operatively connected to

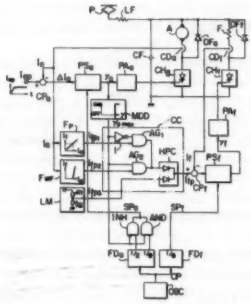
inhibit operation of all of said switching devices in response to said cut-off signal.

4,528,487

ELECTRIC CAR CONTROL SYSTEM

Yoshiji Jimbo, Kudamatsu, and Kazuyoshi Kotake, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 536,876
Claims priority, application Japan, Oct. 1, 1982, 57-170839
Int. Cl.³ H02P *5/06*
U.S. Cl. 318—338 **16 Claims**



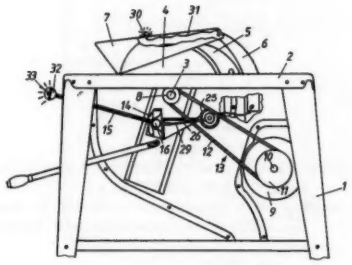
1. An electric car control system comprising:
a DC motor for driving an electric car;
a first series circuit, including an armature winding of said DC motor and an armature chopper for adjusting a current flowing into said armature winding, connected in series to a DC power source;
a second series circuit, including a field winding of said DC motor and a field chopper for adjusting a current flowing into said field winding, connected in series to said DC power source;
armature chopper control means for driving said armature chopper at one of first and second chopping frequencies and for controlling a conduction ratio of said armature chopper so that a ratio of ON time to OFF time thereof in each period of said first and second chopping frequencies is varied;
field chopper control means for driving said field chopper at a constant set chopping frequency and for controlling a conduction ratio of said field chopper so that a ratio of ON time to OFF time thereof in each period of said set chopping frequency is varied; and
command means for selectively delivering to said armature chopper control means one of a first command for driving said armature chopper at said first chopping frequency which is higher than said set chopping frequency of said field chopping control means and a second command for driving said armature chopper at said second chopping frequency which is lower than said first chopping frequency.

4,528,488

WARNING DEVICE USING POWER TOOL RESIDUAL KINETIC ENERGY

Rolf Susemihl, Altes Sonnenbad, D-6380 Bad Homberg v.d. Hohe, Fed. Rep. of Germany

PCT No. PCT/DE82/00196, § 371 Date Jun. 3, 1983, § 102(e) Date Jun. 3, 1983, PCT Pub. No. WO83/01218, PCT Pub. Date Apr. 14, 1983
PCT Filed Oct. 5, 1982, Ser. No. 503,138
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1981, 3139872; May 17, 1982, 3219901
Int. Cl.³ H02P *3/00*
U.S. Cl. 318—38[illegible] **2 Claims**



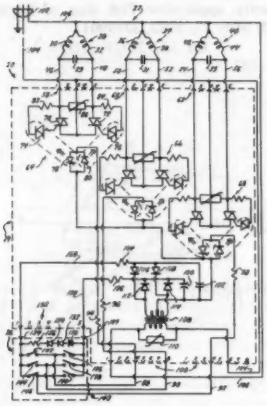
1. A power cutting tool having a rotating blade comprising:
an electric motor with an output shaft;
a first belt pulley mounted on said output shaft;
a working blade member having an input shaft;
a second belt pulley mounted on said input shaft;
a drive belt secured about said first belt pulley and said second belt pulley and operable to move about said pulleys;
an electric switch having an on position and an off position and operable to actuate said electric motor in said on position;
a mechanical lever connected to said electric switch and operable to move said electric switch between said on position and said off position;
an electric generator having a generator input shaft and operable to generate an electric current upon rotation of said generator input shaft;
a third belt pulley mounted on said generator input shaft;
an activating rod anchored at one end to said generator and anchored at another end to said mechanical lever;
an electrically actuated warning signal means electrically connected to said generator and
a mechanical lever locking assembly positioned about said mechanical lever permitting said mechanical lever to facilely move said electric switch from said on position to said off position but preventing said mechanical lever from readily moving said electric switch from said off position to said on position, wherein when said electric switch is in said on position said drive belt moves about said first and second pulleys and does not contact said third pulley, but, when said electric switch is shifted to said off position said third belt pulley contacts said drive belt and exerts a braking action on said drive belt and a rotational action on said generator input shaft producing an electric current from said generator and actuating said warning signal means.

4,528,489

ELECTRICAL REMOTE CONTROL CIRCUIT

Joseph A. Volk, Jr., Florissant, Mo., assignor to Beta Corporation of St. Louis, St. Louis, Mo.

Filed Mar. 28, 1983, Ser. No. 479,156
Int. Cl.[3] H02P *3/10*
U.S. Cl. 318—480 **18 Claims**



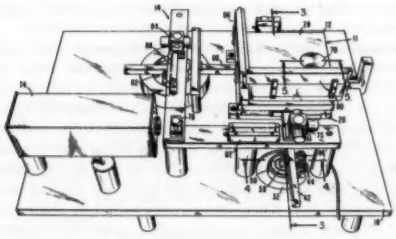
1. A remote control circuit for a hard wired remote control to operate a multi-function device, each function of said device having a two winding motor associated therewith, said remote control circuit having a first wire for carrying a positive control signal to said remote control, a second wire for carrying a negative control signal to said remote control, said remote control having a switch means for each function, a return wire associated with each said switch means so that operation of one of said switch means places either said positive or said negative control signal on said switch means' associated return wire, and said device having a polarity sensitive motor control means connected to said return wires to sense the polarity of the control signal and operate the selected winding of the selected motor.

4,528,490

TWO AXIS DRIVE FOR STAGE

Siegfried Hansen, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 11, 1982, Ser. No. 407,024
Int. Cl.[3] G05B *11/18*
U.S. Cl. 318—560 **16 Claims**



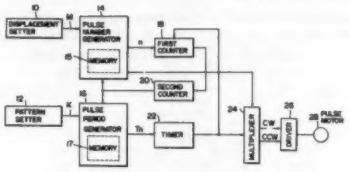
1. A positioning stage comprising:
a base;
an intermediate plate, guide means engaged on said base and engaged on said intermediate plate for guiding said intermediate plate for motion on a path in a first direction;
a stage plate, guide means engaging both said stage plate and said intermediate plate for moving said stage plate on a path in a second direction with respect to said intermediate plate;
drive means on said base connected to said stage plate for moving said stage plate in its second direction, said drive means including a motor driven capstan, a drive bar pivotally mounted on said stage plate and frictionally engaged with said capstan so that rotation of said capstan moves said stage plate along its second path.

4,528,491

PULSE MOTOR CONTROL APPARATUS

Kunihiko Takeuchi, Kawasaki; Kiyoshi Hayashi, and Yasuo Shimomura, both of Tokyo, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 564,082
Claims priority, application Japan, Dec. 28, 1982, 57-230182
Int. Cl.[3] G06F *15/46*
U.S. Cl. 318—603 **5 Claims**

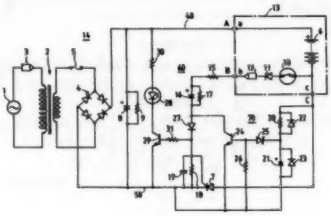


1. A pulse motor control apparatus comprising:
a pulse motor;
a first memory means for storing a plurality of different pulse number data blocks corresponding in number to the number of pulses required for the maximum displacement of said pulse motor, each of said pulse number data blocks consisting of pulse number data obtained by dividing a given number of pulse motor drive pulses by a number N, said pulse number data being stored in N displacement divisions such that the sum of the pulse numbers stored in the respective displacement divisions is equal to said given number of pulse motor drive pulses;
a second memory means for storing displacement pattern data consisting of a plurality of different pulse period data blocks, each of said pulse period data blocks consisting of pulse period data stored in N pulse period divisions corresponding to said displacement divisions; and
a pulse generating means for generating successive pulses supplied to said pulse motor, said successive pulses being generated as pulses which correspond in number to the pulse numbers of said respective displacement divisions in the pulse number data block stored in said first memory means corresponding to a specified number of pulse motor drive pulses and which have pulse periods of the respective pulse period divisions in the pulse period data block stored in said second memory means corresponding to a specified displacement pattern;
wherein said pulse generating means includes:
a displacement setter for selecting the displacement of said pulse motor by specifying the block number of any of said pulse number data blocks stored in said first memory means; and
a pattern setter for selecting the displacement pattern of said pulse motor by specifying the block number of any of said pulse period data blocks stored in said second memory means.

4,528,492
BATTERY CHARGER

Masahiro Inaniwa, and Yoichi Ogawa, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,368
Int. Cl.³ H02J 7/10
U.S. Cl. 320—36 **11 Claims**



1. A battery charger including a rectifier connected to a source of alternating voltage for generating a rectified sinusoidal halfwave voltage, the charger comprising;

first gate-triggered switching means having an anode connected to a negative pole of a rechargeable battery and a cathode connected to a negative terminal of said rectifier for applying said sinusoidal halfwave voltage to the battery;

trigger means connected between the negative pole of said battery and the gate of said first switching means for triggering the same into conduction to apply said voltage to said battery when the instantaneous value of the sinusoidal voltage is higher than the voltage of said battery;

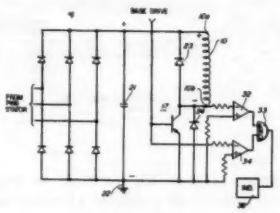
temperature responsive switching means for disconnecting said trigger means from said battery when said battery is heated to a temperature higher than a predetermined value, indicative of fully charged battery; and

second gate-triggered switching means responsive to said temperature responsive switching means establishing a short-circuit path across the cathode and the gate of said first switching means to prevent further charging of the battery after it has been fully charged, notwithstanding a subsequent cooling of the battery below the predetermined value.

4,528,493
DETECTOR FOR SHORTED ROTATING DIODE OF A BRUSHLESS ALTERNATOR

William Spencer, Rockford, and Melvin C. Jackovich, Stillman Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 25, 1983, Ser. No. 554,945
Int. Cl.³ H02H 7/06
U.S. Cl. 322—99 **12 Claims**



1. In a brushless alternator having an exciter field circuit including a source of DC potential with a reference, a stationary exciter field winding and a voltage regulator transistor connected in series with the field winding across the DC source, a rotor with an exciter armature, a diode rectifier connected with said armature and a main field winding connected with the diode rectifier, a stator winding in which the alternator output voltage is developed coupled with the main field winding, and a voltage regulator responsive to the alternator output providing a base drive signal to the voltage regulator transistor, an improved detector for a shorted diode rectifier, comprising:

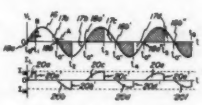
means for comparing the voltage at the base of the voltage regulator transistor and the voltage at the terminal of said stator field winding connected with said voltage regulator transistor; and

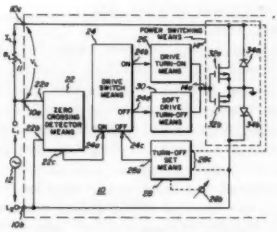
means responsive to the comparing means for indicating the occurrence of a shorted diode rectifier on said rotor.

4,528,494
REVERSE-PHASE-CONTROL POWER SWITCHING CIRCUIT AND METHOD

Milton D. Bloomer, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,296
Int. Cl.³ G05F 1/44
U.S. Cl. 323—237 **24 Claims**





1. A reverse-phase-control power switching circuit for controlling the angle of conduction of current flow through a load from an A.C. source, comprising:

power switching means, in electrical series connection with said load and said source, for allowing a flow of current through said load responsive to a first input condition, and for disabling current flow through said load responsive to a second input condition;

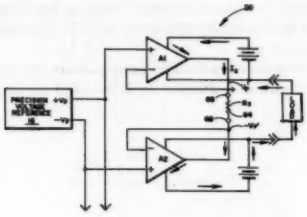
first means for providing said first input condition to said power switching means to cause current to flow through said load commencing substantially at, and responsive only to, each zero crossing of the A.C. signal waveform of said source; and

second means for providing said second input condition to said power switching means at a termination time, after the occurrence of each zero crossing and prior to the next successive zero-crossing occurrence, selected to establish the desired conduction angle of current flow through said load.

4,528,495
FLOATING PRECISION CURRENT SOURCE

Adrian K. Dorsman, Sheldon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 12, 1983, Ser. No. 560,774
Int. Cl.[3] G05F *1/46*
U.S. Cl. 323—268 7 Claims

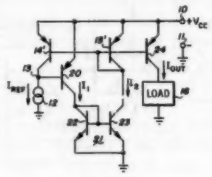


1. A floating precision current source circuit comprising:
a voltage source means referenced to a reference potential, such as ground, for providing:
a differential voltage reference source having first and second reference voltage source terminals, said differential reference voltage source providing first and second reference voltages with respect to said reference potential at said first and second reference voltage source terminals, and
a floating first means for generating a precision unipolar current, said floating first means being responsive to said differential voltage reference source and having
a scaling resistor, having a predetermined resistance value, and a first and second terminal;
said floating first means also having
a current source terminal, and
a current sink terminal;
a first floating voltage follower means having an input coupled to said first voltage reference source terminal;
a sink terminal coupled to said current sink terminal, and an output terminal for providing an output voltage essentially equivalent to said first reference voltage, said floating voltage follower coupling said first floating voltage follower output voltage to said current scaling resistor first terminal, and coupling said unipolar current from said current sink terminal to said scaling resistor first terminal;
a second floating voltage follower means having an input coupled to said second voltage reference source terminal,
a source terminal coupled to said current source terminal and an output terminal for providing a voltage essentially equivalent to said second predetermined reference voltage at said current scaling resistor second terminal, said second floating voltage follower coupling said unipolar current from said scaling resistor second terminal to said current source terminal;
load means for coupling said current source terminal at a first potential to said current sink terminal at a second potential;
said floating first means controlling the value of said precision unipolar current from said current source terminal, through said load means to said current sink terminal, said precision unipolar current value being relatively independent of said current source terminal first potential and said current sink terminal second potential and relatively equal to the value of said differential voltage reference source voltage divided by said scaling resistor predetermined resistance value.

4,528,496
CURRENT SUPPLY FOR USE IN LOW VOLTAGE IC DEVICES

Toyojiro Naokawa, Tsurugashimamachi, and Matsuro Koterasawa, Tokyo, both of Japan, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 23, 1983, Ser. No. 507,309
Int. Cl.[3] G05F *3/20*
U.S. Cl. 323—315 8 Claims

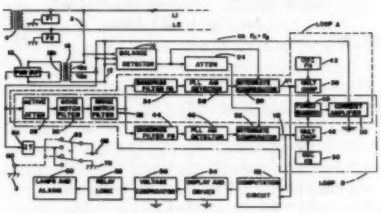


1. A low voltage current supply for providing an output current that is a multiple, N, of a reference currrent, said supply comprising:
output transistor means for conducting said output current in response to base drive;
a first current mirror composed of said output transitor means and a diode operated input transistor coupled to drive the base of said output transistor means, said diode operated transistor being ratioed at 1/N times the area of said output transistor means;
a constant reference current input means coupled to conduct the collected current of said diode operated transistor;
a common emitter transistor amplifier having a base coupled to said collector of said diode operated transistor, and a collector; and
a second current mirror having a diode connected input transistor coupled to conduct the collector current of said common emitter transistor amplifier and a base driven output transistor coupled to drive the diode operated input transistor of said first current mirror.

4,528,497
METHOD AND APPARATUS FOR MONITORING GROUND FAULTS IN ISOLATED ELECTRICAL SYSTEMS

Gabor P. Arato, Toronto, Canada, assignor to Isolation Systems Limited, Ontario, Canada

Filed Aug. 23, 1982, Ser. No. 410,644
Int. Cl.[3] G08B *21/00*; G01R *31/02*
U.S. Cl. 324—51 19 Claims



1. A line isolation monitor for use with an ungrounded power distribution system with conductors having fault admittances to ground, and comprising:
current means for applying a measurement current to said system containing simultaneously at least two measurement frequency components;
frequency selective measurement means responsive to the response of the system to the measurement current at each

of the frequencies of said current means, the measurement means providing output signals proportional to the fault admittances;

computation means connected to said measurement means to receive the output signals and to calculate the maximum fault admittance at the system frequency, and,

display means responsive to said computation means to indicate isolation of said system from ground.

4,528,498

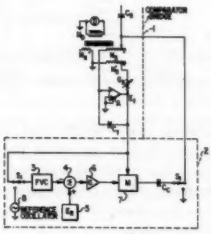
FREQUENCY COMPENSATING CURRENT CIRCUIT FOR A CURRENT COMPARATOR CAPACITANCE BRIDGE

Eddy So, 18 Crownhill St., Ottawa, Ontario, Canada (K1J 7K4)

Filed Jun. 16, 1983, Ser. No. 504,878

Int. Cl.³ G01R *11/52, 27/26*

U.S. Cl. 324—59 **4 Claims**



1. In a current comparator capacitance bridge for measuring inductance wherein the bridge includes first comparator winding means connected to a reference capacitor, second comparator winding means for connection to the inductance, and a comparator amplifier connected to the first comparator winding for providing a reduced replica of a voltage applied to the bridge, a compensating current circuit for rendering the bridge insensitive to frequency fluctuations comprising:

first means for deriving a signal as a function of the frequency fluctuation;

second means coupled to the first means for producing an amplitude controlled replica voltage; and

third means for converting the amplitude controlled replica voltage to a compensating current for application to the first comparator winding means.

4,528,499

MODIFIED BRIDGE CIRCUIT FOR MEASUREMENT PURPOSES

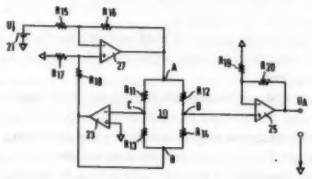
Stefan Traub, Boblingen, Fed. Rep. of Germany, assignor to Hewlett-Packard GmbH, Palo Alto, Calif.

Filed Oct. 7, 1982, Ser. No. 433,226

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142325

Int. Cl.³ G01R *27/02*

U.S. Cl. 324—62 **2 Claims**



1. A bridge circuit for measuring purposes including at least one impedance element which is variable in accordance with an entity to be measured,

a voltage applied to a first bridge diagonal,

a signal corresponding to the measured entity derived at a second bridge diagonal, and

a first junction of the second bridge diagonal being virtually connected to ground by means of an operational amplifier, said bridge circuit comprising in combination:

an inverting input of a second operational amplifier connected via a first resistor to a first terminal of a d.c. source, and connected via a second resistor to the output of the second operational amplifier, as well as with a first junction of the first bridge diagonal;

a non-inverting input of the second operational amplifier connected via a third resistor to a second terminal of the d.c. source, and via a fourth resistor to a second junction of the first bridge diagonal; and

the second terminal of the d.c. source connected to ground.

4,528,500

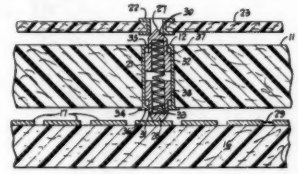
APPARATUS AND METHOD FOR TESTING CIRCUIT BOARDS

James D. Lightbody, and William S. Lightbody, both of 32600 Fairmount Blvd., Pepper Pike, Ohio 44124

Continuation-in-part of Ser. No. 210,539, Nov. 25, 1980, Pat. No. 4,443,756. This application Dec. 9, 1983, Ser. No. 559,728

Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 PC **27 Claims**



1. In an electrical device having a number of contacts for use with a different number of spaced pads, the improvement comprising means to move one of the number of contacts or the different number of spaced pads in planar relation to the other of the number of contacts or the different number of spaced pads, such movement allowing one to substantially optimally align the number of contacts with the different number of spaced pads.

4,528,501

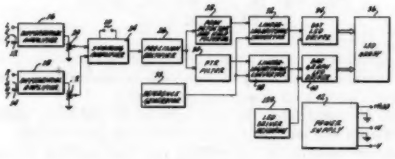
DUAL LOUDNESS METER AND METHOD

Michael L. Dorrough, Woodland Hills, and Kenneth S. Gold, Canoga Park, both of Calif., assignors to Dorrough Electronics, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 252,807, Apr. 10, 1981, abandoned, and a continuation-in-part of Ser. No. 279,305, Jul. 1, 9181, abandoned. This application May 14, 1982, Ser. No. 378,217

Int. Cl.³ G01R *19/04, 1/00;* **H04R** *25/00*

U.S. Cl. 324—103 P **15 Claims**



1. A method for simultaneously displaying dual readings of

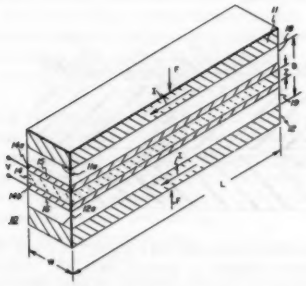
equivalent loudness of peak type and average persistence type audio program material on a meter connected to a source of electrical signals carrying aid audio program, said source having control means for adjusting the strength of said signals comprising the steps of generating a first drive signal for said meter to give a visual display of instaneous peak amplitude of said signal, generating a second drive signal for said meter independently of said first drive signal and having a rise time of about 600 milliseconds to give a visual display of the average persistence of said signal, said first and second signals having the same relative gain, providing a visual readout and scale on said metering system, designating upper limit reference zones on said readout and scale, one for peak amplitudes and another for average persistence, said reference zones having separation of 12–14 dB, and adjusting the program level with the control means so that one of the peak or the persistence displays reaches its respective reference zone without the other exceeding its respective reference zone.

4,528,502

CURRENT SENSOR

Henry A. F. Rocha, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1982, Ser. No. 432,207
Int. Cl.³ G01R *19/00*
U.S. Cl. 324—117 R **14 Claims**



1. A sensor for measuring the magnitude of an A.C. current, comprising:

first and second conductive members positioned parallel to, and spaced from, one another; said first and second conductive members each having the total and identical A.C. current flowing in the same direction therethrough; and

means positioned between said conductive members for non-magnetically generating a signal of magnitude responsive to the magnitude only of a mechanical force generated by the identical current flowing through each of said conductive members.

4,528,503

METHOD AND APPARATUS FOR I-V DATA ACQUISITION FROM SOLAR CELLS

Steven W. Cole, Covina, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Mar. 19, 1981, Ser. No. 245,583
Int. Cl.³ G01R *31/26*
U.S. Cl. 324—158 D **10 Claims**

6. Apparatus for logging current-voltage data characteristics of the operation of an array of solar cells between open-circuit and short-circuit load conditions comprising

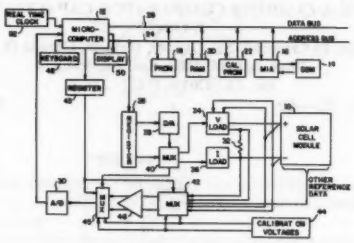
means for controlling the load voltage of said array points between and including open circuit and short circuit,

means for selectively controlling the load current of said array at points between and including open circuit and short circuit,

means for sensing the voltage output of said array under varying load conditions,

means for sensing the current output of array under varying load conditions,

means for operating said current load control means for selectively controlling at intervals the current load of said array while said voltage output is sensed from open circuit to at least the point where the percentage change of voltage is equal to or greater than the percentage change of controlled current,



means for operating said voltage load control means for selectively controlling at intervals the voltage of said array while said current output is sensed from short circuit to at least the point where the percentage change of current is equal to or greater than the percentage change of controlled voltage, and

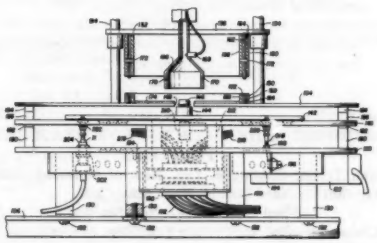
means for storing each value of sensed current and voltage output in digital form.

4,528,504

PULSED LINEAR INTEGRATED CIRCUIT TESTER

Max C. Thornton, Jr., Palm Bay; Paul Kuntz; Russell L. Meyer, both of Melbourne, and Kenneth M. Rosier, Rockledge, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 27, 1982, Ser. No. 382,603
Int. Cl.³ G01R *31/02, 15/12*
U.S. Cl. 324—158 F **13 Claims**



1. An integrated circuit tester comprising:

a test cabinet means having a bottom, side and top walls, for forming an electromagnetic shielded enclosure, said top wall includes an aperture;

test board means mounted in said cabinet means for interconnecting electrical signals between a device under test and a control unit;

a device receptacle means extending up from said test board means and positioned in said aperture in said top wall;

hood means exterior said test cabinet for enclosing a device under test in said device receptacle means when said hood means is lowered to engage said top wall and forming an electromagnetic shielded and thermal enclosure about said device under test; and

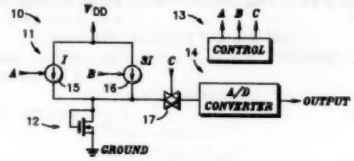
thermal means in said hood means for controlling the temperature of said device under test.

4,528,505

ON CHIP VOLTAGE MONITOR AND METHOD FOR USING SAME

Joe W. Peterson, Austin, Tex., assignor to Motorola, Inc., Schamburg, Ill.

Filed Mar. 29, 1983, Ser. No. 480,166
Int. Cl.[3] G01R *31/26, 31/00*
U.S. Cl. 324—158 R **9 Claims**



1. In an integrated circuit having an analog to digital converter with a multiplexed input terminal, a method of providing a digital test value of a predetermined voltage associated with said integrated circuit, comprising the steps of:

selectively coupling said predetermined voltage to the multiplexed input terminal of said analog to digital converter;

selectively measuring and converting said predetermined voltage to the digital test value via said analog to digital converter which functions to provide other digital values in addition to said test value; and

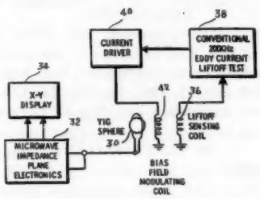
outputting said test value, said test value providing information related to operability of the integrated circuit.

4,528,506

FERROMAGNETIC RESONANCE PROBE LIFTOFF SUPPRESSION APPARATUS

Thomas J. Davis, Issaquah, and Paul L. Tomeraasen, West Richland, both of Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1982, Ser. No. 444,004
Int. Cl.[3] G01N *27/82;* **G01R** *33/12*
U.S. Cl. 324—225 **5 Claims**



1. A liftoff suppression apparatus for a ferromagnetic probe comprising in combination:

a ferromagnetic resonance probe comprising a sphere of yttrium iron garnet, a loop wire in close proximity to and substantially surrounding said sphere to couple with but not in contact with said sphere, means for applying an RF current to said loop of wire, said ferromagnetic resonance probe having a microwave frequency associted therewith, and a magnet to apply a constant magnetic field to said sphere,

a liftoff sensing coil located in close proximity to said sphere but not coupling with the microwave frequency field associated with said sphere due to the RF current flowing in said loop of wire around said sphere, said liftoff sensing coil measuring the amount of liftoof to said ferromagnetic resonance probe from the surface under test and providing a liftoff signal in proportion thereto,

a means for measuring eddy currents, said eddy current measuring means receiving said liftoff signal from said liftoff sensing coil, said eddy current measuring means providing a current driver signal in response to said liftoff signal,

a current driver means receiving said current driver signal from said eddy current measuring means, said current driver means generating a bias signal in response to said current driver signal, and,

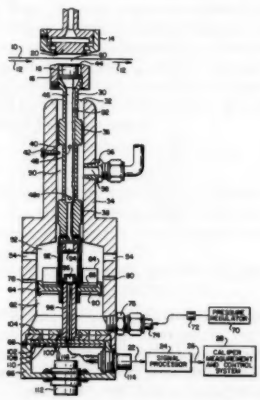
a bias field modulating coil positioned around said ferromagnetic resonance probe so that it will couple with said sphere, said bias field modulating coil receiving said bias signal from said current driver means, said bias signal modulating said bias field modulating coil to modulate the bias field of said ferromagnetic resonance probe so as to counteract the liftoff of said ferromagnetic resonance probe.

4,528,507

SHEET MEASURING APPARATUS WITH TWO STRUCTURALLY ISOLATED NON-CONTACTING SURFACE FOLLOWER BODIES AND WIRELESS SIGNAL TRANSMISSION

Thomas M. Domin, Galena; Dan R. Landis, Bexley, and Paul Williams, Columbus, all of Ohio, assignors to AccuRay Corporation, Columbus, Ohio

Filed Oct. 26, 1981, Ser. No. 315,200
Int. Cl.[3] G01B *7/10;* **G01R** *33/12;* **G01N** *27/72*
U.S. Cl. 324—229 **16 Claims**



1. Apparatus for measuring a property such as caliper, weight per unit area, formation or opacity of a sheet which is traveling longitudinally generally along a sheet path, said apparatus comprising

a sensor body and a target body which during the measurement are located on opposite sides of the sheet and constrained without solid bodily contact (except for accidental or occasional) with the bodies for movement along respective portions of a mutual sensor path intersecting the path of the sheet, the movement being unimpeded by the friction that would otherwise result from solid bodily contact,

means effective without solid bodily contact (except for accidental or occasional) with the sheet and the bodies for normally maintaining each of the sensor and target bodies at respective, substantially constant distances from the opposite, nominal surfaces of the sheet while permitting

the movement of the bodies along the sensor path in response to the position and thickness of the sheet between the nominal surfaces,

sheet property sensing means, including means aboard the sensor body and means aboard the target body interacting through the sheet to produce aboard the sensor body a response dependent on the sheet property,

means aboard the sensor body utilizing the sheet property dependent response to produce manifestations thereof and to transmit the manifestations without using solid bodily connections through a space that is unoccupied by a solid bodily connecting member to a location spaced from the sensor body, and

means including means at the spaced location for detecting the manifestations and producing a sheet property-indicative response.

4,528,508

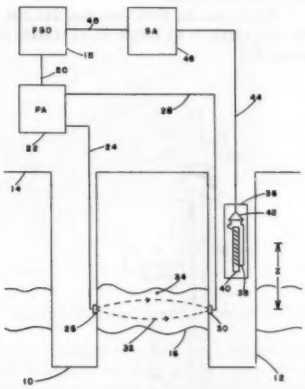
NUCLEAR MAGNETIC RESONANCE METHOD AND APPARATUS FOR REMOTE DETECTION AND VOLUMETRIC MEASUREMENT OF PETROLEUM RESERVES

William B. Vail, III, Bothell, Wash., assignor to ParaMagnetic Logging, Inc., Bothell, Wash.

Filed Jun. 10, 1982, Ser. No. 387,198

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—303 **31 Claims**



1. The apparatus for remote detection and volumetric measurement of a petroleum reservoir which comprises:

a means for applying an A.C. magnetic field at the Larmor frequency to a significant portion of the oil bearing formation thereby placing said formation into a condition of nuclear magnetic resonance and thereby causing a variation in the paramagnetism of said formation; and

a means which measures the variation in the magnetic field of the earth above said oil bearing formation which is caused by said variation in the paramagnetism of the oil bearing formation;

whereby the petroleum reservoir contains constituents with nuclear magnetic moments; and

whereby the petroleum reservoir is acted upon by the earth's magnetic field; and

whereby the earth's magnetic field causes said nuclear magnetic moments to align along the direction of the earth's magnetic field; and

whereby this said alignment causes the said paramagnetism of the oil bearing formation; and

whereby the direction of the said A.C. magnetic field is at an angle to the direction of the earth's magnetic field; and

whereby, depending on the longitudinal and transverse relaxation times of the fluids in the oil bearing formation, the strength and frequency sweep rate of the A.C. magnetic field are appropriate to place a significant portion of the oil bearing formation into a condition such as saturation whereby the paramagnetism of the formation is affected during resonance.

4,528,509

SPATIALLY SELECTIVE NMR

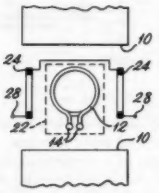
George K. Radda, Oxford; John C. Waterton, Runcorn, and David G. Gadian, Holcot, all of England, assignors to National Research Development Corporation, London, England

Filed Sep. 8, 1982, Ser. No. 416,066

Claims priority, application United Kingdom, Sep. 9, 1981, 8127204

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **6 Claims**



1. A method of high resolution pulsed NMR spectroscopy, in which at least part of a sample to be investigated is immersed in a uniform static magnetic field and a signal relating to a given nuclear species is acquired from the sample following irradiation of at least said part of the sample with a pulse of radio frequency energy such that the r.f. magnetic field is inhomogeneous in said part of the sample, characterized in that prior to said irradiation said part of the sample is subjected to a preparatory treatment which involves irradiating it in a similar manner with at least one pulse which is effective to cause 180N° rotation of the magnetisation for those nuclei of said species which are located within a selected region of said part of the sample, N being an integer.

4,528,510

DEVICE FOR GENERATING IMAGES OF AN OBJECT UNDER EXAMINATION USING NUCLEAR MAGNETIC RESONANCE

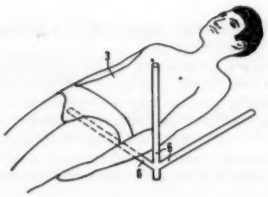
Wilfried Loeffler, Herzogenaurach, and Arnulf Oppelt, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,135

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235113

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **1 Claim**



1. In a device for generating images of an object under examination using nuclear magnetic resonance in which coils are provided for applying magnetic fields to the object under

examination, and for recording the displacement of the atomic nuclei of the object under examination from their equilibrium state by a high-frequency magnetic excitation pulse, and in which at least one calibration device is attached to the coils, the improvement comprising, a calibration device designed so that it at least partially encompasses the object of examination externally during measurement, and that, for each image plane selected, it is at least partially intersected by the image plane during measurement.

4,528,511

CIRCUIT FOR DIGITAL FM DEMODULATION

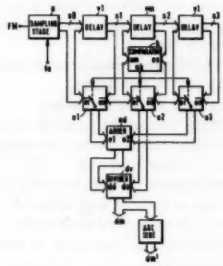
Robert Smith, Meyrin, Switzerland, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 22, 1983, Ser. No. 554,206

Claims priority, application European Pat. Off., Nov. 26, 1982, 82110945.1

Int. Cl.³ H03D *3/00*

U.S. Cl. 329—50 **16 Claims**



12. A demodulation circuit for providing digital output signals representative of a demodulated analog FM signal from samples of said analog FM signal, where each of said samples is a digital signal representation, said samples occuring at a predetermined rate, said circuit comprising:

means for comparing a first sample from a group of sequentially occuring samples to a second sample from said group;

means responsive to said comparing means for selecting a subgroup of samples from said group; and

means for generating said digital output signals from said selected subgroup.

4,528,512

TIMING SYNCHRONIZING CIRCUIT FOR DEMODULATORS

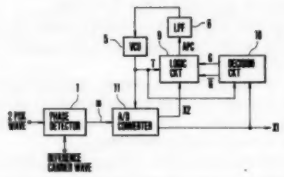
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,653

Claims priority, application Japan, Mar. 4, 1983, 58-35348

Int. Cl.³ H03L *7/08;* **H04L** *27/22*

U.S. Cl. 329—50 **5 Claims**



1. A timing synchronizing circuit for regenerating a timing signal from a baseband signal subjected to a bandwidth limitation, comprising:

voltage controlled oscillator means responsive to a control signal for providing said timing signal;

A/D converter means responsive to said timing signal for sampling said baseband signal and converting it into a plurality of digital signals;

decision circuit means responsive to an output of said A/D converter means for deciding the polarity of a differential coefficient of said baseband signal at an optimum sampling point; and

logic circuit means responsive to the output of said decision circuit means for deciding whether or not said baseband signal shifts from a level corresponding to said optimum sampling point, thereby providing said control signal.

3. A demodulation apparatus comprising in combination a demodulation circuit for demodulating a carrier wave modulated with a baseband signal subjected to a bandwidth limitation and a timing synchronizing circuit for regenerating a timing signal from the demodulated baseband signal;

said timing synchronizing circuit including a plurality of A/D converter means responsive to said timing signal for sampling said demodulated baseband signal and providing a plurality of digital signals; and

at least one clock synchronizing circuit including a voltage controlled oscillator responsive to a control signal for providing said timing signal, a decision circuit reponsive to said timing signal and an output of said A/D converter means for deciding the polarity of a differential coefficient of said baseband signal at an optimum sampling point, and a logic circuit responsive to said timing signal, the output of said decision circuit and the output of said A/D converter means, for deciding whether or not said baseband signal shifts from a level corresponding to said optimum sampling point, thereby providing said control signal;

said demodulation circuit including a carrier synchronizing circuit responsive to the outputs of said timing synchronizing circuit for providing a reference carrier wave, a pair of phase detectors for detecting the modulated carrier wave with said reference carrier wave and providing said demodulated baseband signal.

4,528,513

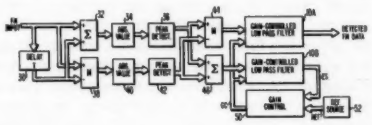
DIGITAL FM RATIO DETECTOR WITH GAIN-CONTROLLED FILTER

Charles B. Dieterich, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 25, 1983, Ser. No. 488,595

Int. Cl.³ H03D *1/00*

U.S. Cl. 329—145 **22 Claims**



1. A digital detector for producing digital output signals representing information signals in response to digital input signals representing said information signals frequency modulated on a carrier signal comprising:

means responsive to said digital input signals for producing first and second detected digital signals, said first detected digital signals representing the envelope of said carrier signal, and said second detected digital signals representing the product of the frequency modulation and the envelope of said carrier signal;

a first digital filter having controllable gain for producing first filtered digital signals in response to said first detected digital signals, said controllable gain of said first digital filter being controlled in response to a control signal;

a second digital filter having controllable gain for producing second filtered digital signals in response to said second detected digital signals, said controllable gain of said second digital filter being controlled in response to said control signal; and

control means for developing said control signal in response to one of said first and second detected digital signals and for applying said control signal to said first and second digital filters to control the respective gains thereof,

wherein one of said first and second filtered digital signals is supplied as said digital output signals.

4,528,514

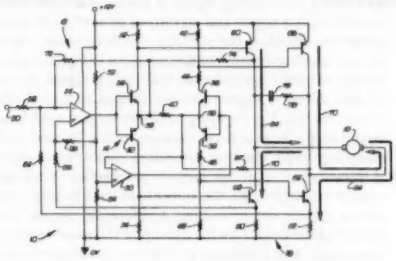
TRANSCONDUCTANCE AMPLIFIER OPERABLE WITH BIPOLAR INPUT

James E. Quackenbush, Canoga Park, Calif., assignor to Computer Memories, Incorporated, Chatsworth, Calif.

Filed Nov. 28, 1983, Ser. No. 555,374

Int. Cl.[3] **H03F** *3/26;* **G05F** *1/00*

U.S. Cl. 330—146 **12 Claims**



1. A transconductance amplifier which is supplied by a single power supply, comprising:

input means for receiving a bipolar input voltage and providing a unipolar output voltage, said input means being supplied by a single supply voltage;

a bridge drive network, driven by the output of the input means, said bridge drive network being supplied by the single supply voltage and having (a) first and second pairs of complementary transistors, the first pair being driven by the output of input means and having a current input terminal of one connected to a current output terminal of the other at a first connection point, the second pair having a current input terminal of one connected to a current output terminal of another at a second point, (b) a resistor having its terminals connected between the first and second points and (c) means for driving the second complementary pair to maintain the voltage of the second point at a predetermined voltage, wherein a first output current path includes a transistor of the first pair, the resistor and a transistor of the second pair and a second output current path includes the other transistor of the first pair, the resistor and the other transistor of the second pair, wherein when the output voltage of the input means is greater than the predetermined voltage a first bridge current will flow through the first current path and when the output voltage of the input means is less than the predetermined voltage a second bridge current will flow through the second current path; and

output bridge means driven by the first and second bridge currents and providing first and second output currents, respectively, in first and second directions.

4,528,515

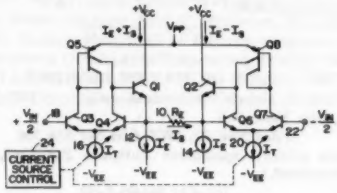
HIGH FREQUENCY DIFFERENTIAL AMPLIFIER WITH ADJUSTABLE DAMPING FACTOR

Winthrop A. Gross, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 7, 1983, Ser. No. 464,287

Int. Cl.[3] **H03F** *3/45*

U.S. Cl. 330—254 **5 Claims**



1. A high-frequency differential amplifier, comprising:

an emitter-coupled pair of transistors, each having a collector, a base, and an emitter;

a signal-current-developing resistor connected between the emitters of said pair of transistors;

means for biasing each of said transitors;

an input buffer stage connected to each of said transistors, each of said buffer stages having the transconductance characteristic of a transistor; and

a pair of variable current sources for providing a variable operating current to each of said buffer stages thereby to vary the transconductance of each buffer stage without substantially affecting the operation of said emitter-coupled pair of transistors.

4,528,516

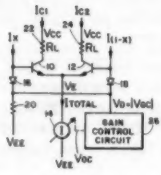
DIFFERENTIAL AMPLIFIER WITH DYNAMIC THERMAL BALANCING

Thomas C. Hill, III, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 1, 1983, Ser. No. 519,472

Int. Cl.[3] **H03F** *3/45;* **H03G** *3/20*

U.S. Cl. 330—254 **1 Claim**



1. A variable-gain differential amplifier with dynamic thermal balancing, comprising:

means for providing a selectable gain control voltage and an absolute value voltage which is proportional to the absolute value of said gain control voltage;

at least one pair of emitter-coupled transistors, each having a base for receiving input signals and a collector coupled to a load resistor; and

variable current generator means responsive to said gain control voltage coupled to said emitters of said emitter-coupled transistors for providing selectable quiescent current through said transistors;

wherein said absolute value voltage is coupled to both bases of said emitter-coupled pair of transistors thereby to control the collector-to-emitter voltage of said transistors such that said collector-to-emitter voltage is changed

proportionately with changes in said selectable quiescent current.

4,528,517

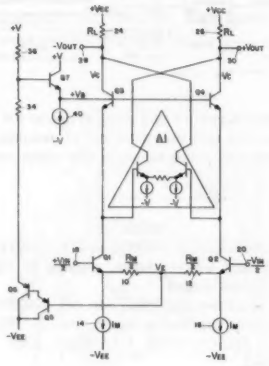
OVERDRIVE THERMAL DISTORTION COMPENSATION FOR A QUINN CASCOMP AMPLIFIER

Kenneth G. Schlotzhauer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 7, 1983, Ser. No. 464,795

Int. Cl.³ H03F *3/45, 1/30*

U.S. Cl. 330—256 **1 Claim**



1. A cascomp amplifier, comprising:

a main amplifier comprising an emitter-coupled pair of transistors for converting an input signal to a differential signal current;

a common-base amplifier stage coupled to said main amplifier, said common-base amplifier stage comprising a pair of transistors through which said differential signal current passes;

a correction amplifier having a pair of inputs coupled between said main amplifier and said common-base amplifier stage, and a pair of outputs cross-coupled in a current-aiding sense with the outputs of said common-base amplifier;

a buffer amplifier having an input connected to the junction of a pair of equal-valued resistors coupled between the emitters of said emitter-coupled pair of transistors in said main amplifier to sense the average voltage value therebetween;

voltage divider means for receiving said average voltage value and producing a proportional voltage value of said average voltage value; and

an emitter-follower stage having an input coupled to said voltage divider means and an output coupled to the bases of said pair of transistors comprising said common-base amplifier stage.

4,528,518

CHAIN AMPLIFIER

Jakob Huber, Beyharting; Ewald Pettenpaul, Unterhaching, both of Fed. Rep. of Germany, and Felix Petz, Somerset, N.J., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

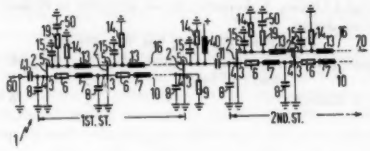
Filed Jul. 28, 1983, Ser. No. 518,141

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228396

Int. Cl.³ H03F *3/16*

U.S. Cl. 330—277 **8 Claims**

1. Chain amplifier assembly, comprising a semiconductor body, a chain amplifier disposed in said semiconductor body and having an input, an output, a plurality of interconnected amplifier stages having transition regions therebetween, each of said stages including a plurality of field-effect transistors having source, gate and drain terminals, each of said source terminals being connected to a given common source potential, at least one ohmic resistor and at least one inductance connected in series between said gate terminals forming a gate line, a plurality of capacitances each having a lead connected to said gate line and another lead connected to the given common source potential, a plurality of inductances connected in series between said drain terminals forming a drain line, at least one



additional ohmic resistor having a lead connected to said drain line and another lead connected to the given common source potential, a plurality of additional capacitances having a lead connected to said drain line and another lead connected to the given common source potential, matching elements in the form of capacitances, inductances and ohmic resistors connected at said input, output and transition regions, said drain and gate lines being wave guides formed at least partly with metal coatings, and insulating coatings and doping concentrations required for said field-effect transistors.

4,528,519

AUTOMATIC GAIN CONTROL

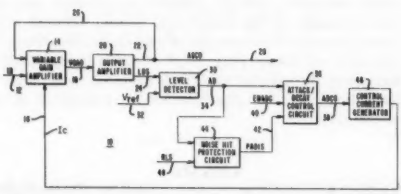
Hans van Driest, Bilthoven, Netherlands, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 30, 1983, Ser. No. 509,280

Claims priority, application United Kingdom, Jan. 12, 1983, 8300696

Int. Cl.³ H03G *3/20*

U.S. Cl. 330—279 **10 Claims**



1. An automatic gain control circuit comprising:

means for amplifying an input signal to develop a first signal;

means for generating a second signal to control the gain of said amplifying means;

means responsive to said first signal and to a predetermined reference voltage level for providing to said generating means a first logic signal when said first signal is greater in amplitude than said predetermined reference voltage level and a second logic signal when said first signal is lower in amplitude than said predetermined reference voltage level, said generating means being responsive to said first logic signal for causing said second signal to vary in a first direction to reduce the gain of said amplifying means and being responsive to said second logic signal for causing said second signal to vary in a second direction to increase the gain of said amplifying means; and

means, responsive to said first logic signal when its duration is

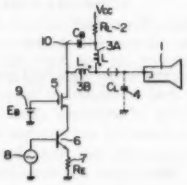
longer than a first predetermined time period, for causing said generating means to prevent said second signal from varying in the first direction for a second predetermined time period, thereby inhibiting any reduction in gain of said amplifying means during the second predetermined time period.

4,528,520

WIDE BAND HIGH OUTPUT AMPLIFIER USING A POWER FIELD EFFECT TRANSISTOR AS AN OUTPUT STAGE

Michitaka Osawa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,495
Claims priority, application Japan, May 21, 1982, 84706
Int. Cl.³ H03F *3/16, 3/193*
U.S. Cl. 330—300 **6 Claims**



1. A wide band high output amplifier for amplifying signals within a predetermined wide band of frequencies comprising:

a field effect transistor used in an output stage of said amplifier;

a peaking circuit for increasing amplification at the upper end of a high frequency band of said amplifier within said wide band of frequencies, said peaking circuit including an output terminal for deriving an output from said peaking circuit, and

means for minimizing an increase in the input impedance characteristic of said field effect transistor caused by said peaking circuit during operation over said predetermined wide band of frequencies, said means comprising forming said peaking circuit as a constant resistance network in which respective circuit constants are selected such that the impedance at the output side of said network when viewed from a drain terminal of said field effect transistor becomes a constant pure resistive value independent of frequency throughout said predetermined wide band of frequencies when a capacitive load is connected to said output terminal.

4,528,521

PRECISION CONTROL FREQUENCY SYNTHESIZER HAVING AN UNSTABLE, VARIABLE FREQUENCY INPUT SIGNAL

Gary J. Grimes, Thornton, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Feb. 9, 1984, Ser. No. 578,697
Int. Cl.³ H03L *7/16*
U.S. Cl. 331—1 A **17 Claims**

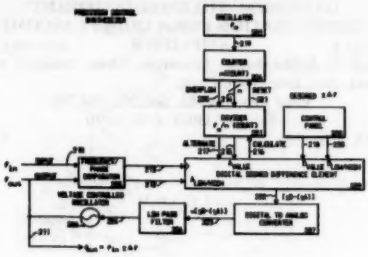
1. A precision controlled frequency synthesizer for maintaining a desired frequency difference between an input and an output signal comprising:

comparator means (**205, 203, 204, 201**) responsive to the receipt of said input and said output signals for generating an actual value signal representative of the actual frequency difference between said input and output signals;

referencing means (**200**) for generating a desired value signal representative of a desired frequency difference;

computation means (**209**) responsive to a receipt of said actual value signal and said desired value signal to said computation means for producing an adjustment signal indicative of the difference between said actual frequency difference and said desired frequency difference; and

control means (**207, 206, 208**) responsive to a receipt of said



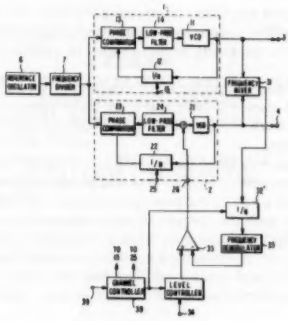
adjustment signal to said control means for changing the frequency of said output signal to maintain said desired frequency difference between said input and output signals.

4,528,522

FM TRANSCEIVER FREQUENCY SYNTHESIZER

Takashi Matsuura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1982, Ser. No. 420,690
Claims priority, application Japan, Sep. 28, 1981, 56-153402
Int. Cl.³ H03L *7/22;* **H03C** *3/08*
U.S. Cl. 331—2 **10 Claims**



1. A transceiver frequency synthesizer comprising: means for generating a reference oscillation; an oscillator means for generating in response to said reference oscillation a local oscillation signal for use in receiving an incoming carrier wave, the frequency of said local oscillation signal being changed in response to a reception channel designation signal; a voltage-controlled oscillator means responsive to a control signal for generating an outgoing carrier wave for use in transmission; a first frequency divider means for frequency-dividing by a prescribed divisor the frequency of said outgoing carrier wave in response to a transmission channel designation signal; a phase comparator means for comparing the phases of the output signal of said first frequency divider means and said reference oscillation; a lowpass filter means for filtering the output signal of said phase comparator means and supplying a filter output signal to said voltage-controlled oscillator means as a portion of said control signal; a frequency mixer means for frequency-mixing the output signal of said oscillator means and that of said voltage-controlled oscillator means to provide a difference signal representative of a frequency difference between them; first adding means for adding a modulating signal

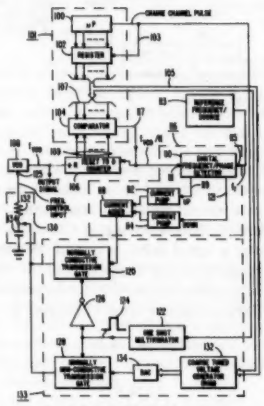
to said filter output signal and for providing the sum to said voltage-controlled oscillator means as said control signal; and means for negatively feeding back said difference signal to said first adding means so that the modulation sensitivity of said voltage-controlled oscillator means to said modulating signal is substantially constant over a broad range of the outgoing carrier wave frequencies and over a broad range of modulating signal levels.

4,528,523

FAST TUNED PHASE LOCKED LOOP FREQUENCY CONTROL SYSTEM

Albert T. Crowley, Somerdale, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1982, Ser. No. 451,423
Int. Cl.³ H03L *7/06*
U.S. Cl. 331—10 **11 Claims**



8. An improved phase-locked loop for locking the phase of an output signal to the phase of an input signal, comprising:

a source of input signal;

a voltage-controlled oscillator including a frequency control input terminal for generating said output signal;

a controllable frequency divider coupled to said voltage-controlled oscillator for dividing the frequency of said output signal to form a divided-frequency signal;

a frequency/phase detector coupled to said source of input signal and to said controllable frequency divider for comparing said input signal with said divided-frequency signal for forming at an output terminal a voltage-controlled-oscillator control signal representing the frequency and phase error therebetween;

filter means including an input terminal for receiving said voltage-controlled-oscillator control signals, and also including an output terminal for generating filtered voltage-controlled oscillator control signals;

coupling means coupled to said output terminal of said frequency/phase detector, to said input terminal of said voltage-controlled oscillator and to said filter means for coupling said filtered voltage-controlled oscillator control signals to said voltage-controlled oscillator for forming a controllable degenerative phase-lock loop for urging the frequency and phase of said divided-frequency signal towards the frequency and phase of said input signal, said coupling means further including a controllable switch for opening said phase-lock loop;

divider control means coupled to said controllable frequency divider and to said switched coupling means for generating digital control signals representing one of a plurality of preselected division ratios for controlling the frequency division ratio of said controllable frequency divider and for operating said switch for opening said degenerative phase-lock loop;

digital-to-analog conversions means including input terminals for receiving digital signals and also including an output terminal coupled to said coupling means for coupling signal to said voltage-controlled oscillator via said filter means for coarse tuning thereof;

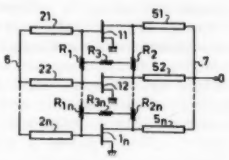
wherein the improvement lies in coarse tuning memory means coupled to said divider control means, to said digital-to-analog conversion means and to said coupling means for receiving said digital control signals representing one of a plurality of preselected division ratios and for applying said digital control signals as addresses to a preprogrammed memory for generating a particular voltage-representative digital signal in response to each of said digital control signals, and for applying said voltage-representative digital signal to said input terminals of said digital-to-analog-conversion means whereby coarse tuning of said voltage-controlled oscillator is accomplished by an analog voltage selected to be near that value which when applied to said voltage-controlled oscillator sets said frequency of said output signal of said voltage-controlled oscillator to equal the frequency of said input signal multiplied by said division ratio rather than by an analog voltage representation of said division ratio.

4,528,524

HYPERFREQUENCY POWER OSCILLATOR

Alain Bert, Gif-sur-Yvette, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 22, 1983, Ser. No. 534,647
Claims priority, application France, Sep. 24, 1982, 82 16158
Int. Cl.³ H03L *1/00*
U.S. Cl. 331—56 **6 Claims**



1. A hyperfrequency power oscillator constituted by a plurality of elementary oscillators coupled in parallel, the improvement wherein each elementary oscillator comprises a field effect transistor (FET) connected in a common drain configuration (ie. with its drain connected to electrical ground), with its source being connected to a quarter-wave $\lambda g/4$, (where λg is the guided wavelength of the oscillation) microstrip line, and its gate being connected to a quarter-wave ($\lambda g/4$) microstrip line, the microstrip lines connected to the gates of the elementary oscillators being interconnected at their ends opposite to their ends connected to the gates, the microstrip lines connected to the sources being interconnected at their ends opposite to their ends connected to the sources, said interconnected ends of the source-connected microstrip lines constituting the output from said power oscillator, the gates being inteconnected by first resistances and the sources being interconnected by second resistances, said first and second resistances serving for balancing purposes and for suppressing parasitic oscillations.

4,528,525

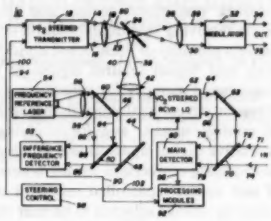
SCANNING LASER FOR A SCANNING LASER RADAR

Dayton D. Eden, Dallas, and William E. Case, Arlington, both of Tex., assignors to LTV Aerospace and Defense, Dallas, Tex.

Filed Aug. 25, 1981, Ser. No. 296,076

Int. Cl.³ H04N 7/18; H01S 3/10

U.S. Cl. 332—7.51 **9 Claims**



1. A scanning laser comprising:

a resonant optical cavity;

a first active laser medium having gain positioned within said resonant cavity;

an output reflector disposed at one end of said resonant cavity;

a control reflector disposed at the opposite end of said resonant cavity from said output reflector;

a first focusing means disposed within said cavity between said output reflector and said first active laser medium;

a second focusing means disposed within said cavity between said control reflector and said laser medium;

an energy source for directing an impinging energy beam onto a selected small area on the surface of said control reflector wherein the reflectivity of the selected small area increases in response to said energy beam creating a high reflectance pixel at the point that said energy beam impinges, the remaining portion of said control reflector being transmissive, said pixel causing reflection of incident light rays in a diffracted pattern within said resonant cavity that are reflected in a conical path, said second focusing means collimating the reflected light rays from said pixel through said first active laser medium, said first focusing means receiving the collimated light rays passing through said first active laser medium and condensing the collimated light rays onto said output reflector, thus forming a complete resonant path, the direction of said resonant path determined by the position of said energy beam on said control reflector thereby generating a coherent light beam at the output of said output reflector;

a piezoelectric material disposed between said first focusing means and said output reflector for varying the optical length of said resonant cavity thereby changing the frequency of resonance;

a first collimating means disposed outside of said resonant cavity for collimating the output of said resonant cavity from said output reflector;

a second active laser medium having gain for receiving and amplifying the output of said first collimating means;

a third focusing means for condensing the output of said second active laser medium;

a second collimating means for collimating the output of said third focusing means, the focal point of said second collimating means overlapping the focal point of said third focusing means; and

a third active laser medium for receiving and amplifying the collimated output of said second collimating means wherein the arrangement of said second and third active laser medium, said first and second collimating means and said third focusing means allow the variable position coherent light beam that is output from said resonant cavity to traverse an angular path without deviating from within the constraints of said second and third active laser medium.

4,528,526

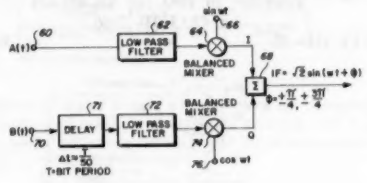
PSK MODULATOR WITH NONCOLLAPSABLE OUTPUT FOR USE WITH A PLL POWER AMPLIFIER

Carol D. McBiles, Paradise Valley, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1983, Ser. No. 499,585

Int. Cl.³ H03C 3/00

U.S. Cl. 332—16 R **5 Claims**



1. In a PSK modulator for use with wideband power amplifier up converter circuits and phase locked loop power amplifier circuits in a communications transmitter, wherein said PSK modulator includes two signal channels, the improvement comprising a signal delay in one of the signal channels, approximately one-fiftieth of the period of the highest bit rate applied to the modulator, to prevent the amplitude of an output signal of the PSK modulator from collapsing to zero.

4,528,527

SECAM MODULATOR

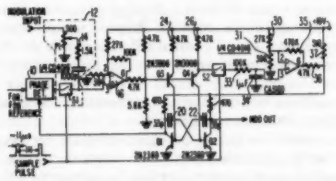
Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 2, 1982, Ser. No. 394,886

Claims priority, application United Kingdom, Mar. 8, 1982, 8206779

Int. Cl.³ H03C 3/00

U.S. Cl. 332—19 **7 Claims**

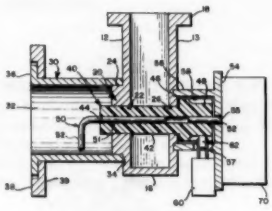


1. A method for controlling the voltage-to-frequency gain of a voltage controlled oscillator, said method comprising controlling the frequency of the output signal from said oscillator in a degenerative feedback manner producing a loop error voltage suitable for effecting synchronization of said output signal frequency with a reference signal frequency during recurring control intervals, superimposing a modulating voltage upon said loop error voltage to produce the frequency control voltage of said oscillator, comparing the average frequency control voltage exhibited during said recurring control intervals with a reference voltage to generate a difference voltage, and controlling a supply voltage for said oscillator in accordance with said difference voltage to maintain said voltage-to-frequency gain substantially constant .

4,528,528
WAVEGUIDE POLARIZATION COUPLING

Eugene P. Augustin, Orlando, Fla., assignor to Boman Industries, Downey, Calif.

Filed Apr. 2, 1982, Ser. No. 364,906
Int. Cl.³ H01P *1/165*
U.S. Cl. 333—21 A **14 Claims**



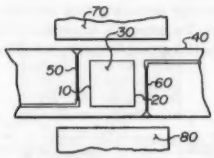
1. A waveguide polarization coupling assembly, comprising:
(a) a rectangular input waveguide having a closed end,
(b) a circular output waveguide adjacent and connected to the rectangular input waveguide at one end and having its longitudinal axis perpendicular to and intersecting with that of the rectangular waveguide element, adjacent the closed end,
(c) a separator wall section disposed at the end of the circular waveguide, forming a common wall between the waveguide elements,
(d) a non-metallic dielectric coupling probe support rotatably mounted and extending across the rectangular waveguide along an extension of the axis of the circular waveguide and rotatably supported at one end by the separator plate wall section, and at the other rear end by the opposed rear wall of the rectangular waveguide, both of which it extends through,
(e) mechanical means connected to the rear end of the dielectric support means for precisely rotating the coupling probe support through an angle of 90°;
(f) the dielectric support means having a central bore which extends in alignment with the axis of the circular waveguide,
(g) a metallic waveguide coupling probe having an elongated support section which is disposed within the bore of the rotatable coupling probe and in turn supports a rotatable short leg which is disposed within the circular waveguide and rotates in a plane extending perpendicular to the central axis of the circular waveguide and spaced from the separator wall section for precisely rotating the polarization of the transmitted wave within the circular waveguide without affecting polarization within the rectangular waveguide, and
(h) the probe being rotatably and longitudinally adjustable with respect to the dielectric coupling probe support to provide a capacitive coupling in the rectangular waveguide, and quasi-capacitive magnetic loop coupling in the circular waveguide.

4,528,529
MAGNETOSTATIC WAVE RESONATOR

Ernst Huijer, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 12, 1983, Ser. No. 560,625
Int. Cl.³ H01P *7/08;* **H03H** *9/15*
U.S. Cl. 333—219 **11 Claims**

1. A resonator device comprising:
a substrate having a planar surface;
a film of ferrimagnetic material having at least two substantially parallel reflective edges for supporting resonance, said film being formed on a portion of said planar surface; and
transducer means adjacent to at least one of said substantially parallel reflective edges but separate from said film

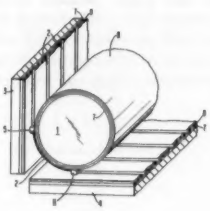


on said planar surface for coupling electromagnetic energy to said resonator.

4,528,530
LOW TEMPERATURE ELECTRONIC PACKAGE HAVING A SUPERCONDUCTIVE INTERPOSER FOR INTERCONNECTING STRIP TYPE CIRCUITS

Mark B. Ketchen, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,911
Int. Cl.³ H01P *5/00*
U.S. Cl. 333—246 **9 Claims**



1. A multidimensional package for a first circuit-bearing substrate and a second circuit-bearing substrate, each having a conductor pattern providing electrical connection to its circuits, and each having an insulated ground plane characterized by
(a) an interposer of crystalline substrate material in continuous angle-free cross section bearing an arcuate insulated ground plane and an arcuate pattern of conductors overlying said insulated ground plane;
(b) first connector means selectively connecting the conductor pattern of the first substrate to the conductor pattern of said interposer; and
(c) second connector means selectively connecting the arcuate conductor pattern of said interposer to the conductor pattern of said second substrate; and further characterized in that the first substrate, the second substrate and said interposer are all comprised of crystalline substrate materials having essentially the same coefficient of thermal expansion.

4,528,531
MOLDED CASE CIRCUIT BREAKER WITH IMPROVED OPERATING MECHANISM

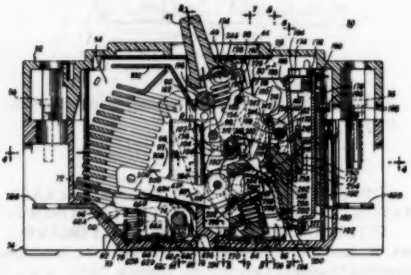
Robert H. Flick, Brighton Township, Beaver County, and Walter K. Huffman, Towamencin Township, Montgomery County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 19, 1983, Ser. No. 562,643
Int. Cl.³ H01H *3/12*
U.S. Cl. 335—23 **16 Claims**

13. An electrical circuit breaker comprising:
a first electrical contact,

a second electrical contact and

operating means for moving said first and second electrical contacts into a CLOSED position and into an OPEN position, said operating means comprising a stop and a toggle mechanism including first and second toggle links and pin means for rotatably interconnecting said first and second toggle links, said first toggle link being configured



to physically contact said stop during a trip operation of said circuit breaker to increase the speed of separation of said first and second electrical contacts during said trip operation, said toggle mechanism further including a movable cradle, said cradle having means for physically contacting said pin means during said trip operation to increase the speed of separation of said first and second electrical contacts during said trip operation.

4,528,532

SWITCH FOR FINE ADJUSTMENT OF PERSISTENT CURRENT LOOPS IN SUPERCONDUCTIVE CIRCUITS

Thomas A. Keim, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,212

Int. Cl.³ H01F 7/22

U.S. Cl. 335—216 **9 Claims**

1. A switch for fine adjustment of current in persistent current superconducting loops comprising:

a length of superconductive material;

a substrate, said length of superconductive material being disposed on an external surface thereof;

means to heat at least a portion of said length of superconductive material; and

means for electrically insulating said superconductive material from said heat means, whereby said superconductive material may be exposed to cryogenic coolants in which said switch may be disposed so that rapid switching between resistive and superconductive states may be effected.

4,528,533

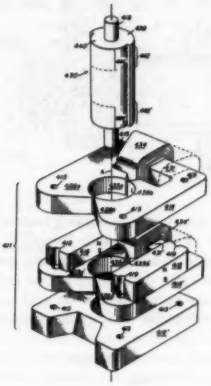
ACTUATOR WITH COMPENSATING FLUX PATH

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Continuation-in-part of Ser. No. 402,432, Jul. 28, 1982,. This application Jul. 24, 1984, Ser. No. 633,900

Int. Cl.³ H01F 7/08

U.S. Cl. 335—230 **16 Claims**



1. In an actuator comprising

a stator assembly which defines a pair of stator pole faces,

a permeable rotor assembly which is positioned to rotate relative to the stator assembly, and which defines a driving pole face separated from each of the stator pole faces by a flux permeable driving gap, the rotor assembly having an operational range of rotor angular positions over which drive flux passing across the driving gap drives the rotor assembly, the extent of the driving gap at one of the stator pole faces being reduced as the rotor assembly rotates toward the limit of the operational range,

the improvement comprising a flux-permeable compensating gap between the driving pole face and each stator pole face which provides a secondary path for drive flux as the rotor assembly rotates toward the limit of the operational range, the compensating gap being less permeable than the driving gap.

4,528,534

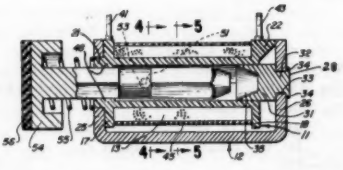
SOLENOID WITH TOLERANCE CONTROL

Reginald A. Read, LaGrange, Ill., assignor to Regdon Corporation, Brookfield, Ill.

Filed May 31, 1984, Ser. No. 616,007

Int. Cl.³ H01F 7/08

U.S. Cl. 335—262 **20 Claims**



1. A solenoid device comprising an integrally molded bobbin defining an armature bore therein and including a collar portion of substantially less axial length than said bore and defining a passage therethrough of reduced transverse dimension relative to the remainder of said bore; a plunger extending into

said bore through said collar portion and serving as an armature of said solenoid, said plunger having a close, sliding fit engagement within said collar portion which controls the movement of said plunger and substantially eliminates lateral movement thereof, said plunger having a loose, sliding engagement in the remainder of said bore; and coil means surrounding said bobbin for generating magnetic flux to move said plunger axially in said bore; said plunger formed of material having high magnetic permeability.

4,528,535

ELECTROMAGNETIC SWITCHING DEVICE

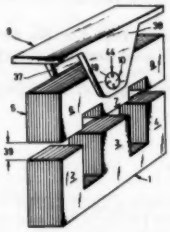
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 504,843

Claims priority, application European Pat. Off., Jun. 19, 1982, 82105390.7

Int. Cl.³ H01H *69/01*

U.S. Cl. 335—273 **5 Claims**



1. An electric switching device, particularly an electromagnetic switch having a stationary magnetic core, a movable armature and a guiding support for the armature, comprising a carrier shaft insertable in the armature and defining a pivot axis, said shaft having cylindrical ends coaxial with the axis and a portion between the ends which has a polygonal cross section; said armature being provided with a passage for receiving said carrier shaft, at least a portion of said passage fitting the polygonal portion of said shaft; said cylindrical ends of the shaft being insertable in the guiding support and the sides of the polygonal shaft portion being unevenly spaced from said pivot axis; and means for changing angular position of the polygonal shaft portion relative to the fitting portion of said armature passage to adjust different clearances between the stationary magnetic core and the armature.

4,528,536

HIGH VOLTAGE FUSE WITH CONTROLLED ARC VOLTAGE

Donald D. Blewitt, Penn Hills, and Theodore Vojnovich, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,053

Int. Cl.³ H01H *85/00*

U.S. Cl. 337—5 **2 Claims**

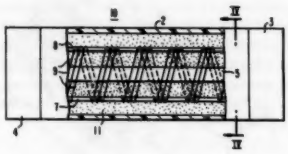
1. A fuse, comprising:

(a) an insulating fuse housing;

(b) electrically conductive terminal means disposed at both ends of said fuse housing for sealing the ends thereof;

(c) an insulated non-linear resistor means comprised of a formulation of zinc oxide and electrically connected between the electrically conductive terminal means within said insulating fuse housing for limiting and shaping the arc voltage developed during current interruption; and

(d) a fuse element electrically connected between the electrically conductive terminal means and in parallel with and



spirally around the non-linear resistor means within the insulating fuse housing.

4,528,537

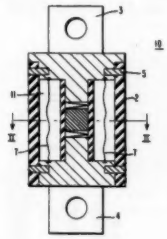
HIGH CURRENT ZINC OXIDE FUSE

Donald D. Blewitt, Penn Hills Township, Allegheny County, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,068

Int. Cl.³ H01H *85/00*

U.S. Cl. 337—5 **5 Claims**



1. A fuse, comprising:

(a) an insulating housing;

(b) electrically conductive terminal means at each end of said insulating housing for sealing the ends thereof;

(c) a plurality of fuse elements traversing the length of said insulating housing electrically connected to the electrically conductive terminal means;

(d) a non-linear resistance means comprised of a zinc oxide formulation for controlling and shaping the arc voltage developed during current interruption electrically connected in parallel with said plurality of fuse elements; and

(e) solidified sand completely filling said insulating housing and surrounding the contents thereof.

4,528,538

COMBINED SWITCH AND CIRCUIT BREAKER

James H. Andersen, P.O. Box 637, Mercer Island, Wash. 98040

Filed Jan. 13, 1984, Ser. No. 570,393

Int. Cl.³ H01H *73/30*

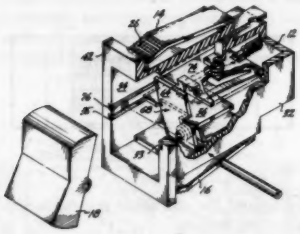
U.S. Cl. 337—43 **9 Claims**

1. A device comprising:

a circuit breaker including trip means for interrupting current flow through the circuit breaker in response to said current flow exceeding a predetermined level and for subsequently preventing the resumption of current flow through the circuit breaker until the trip means is reset; and

a switch connected in series with the circuit breaker, the switch including a switch element movable between a first position in which the switch is open and a second position in which the switch is closed, the switch being con-

structed and arranged such that after interruption of current flow by the trip means, moving the switch element to



the first position first opens the switch and then resets means to permit current flow through said circuit breaker.

4,528,539

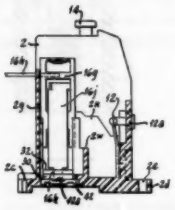
REDUCED-SIZE THERMAL OVERLOAD RELAY

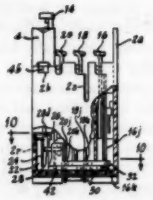
Kenneth A. Forsell, Port Washington, and Edward A. Mallonen, New Berlin, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 28, 1984, Ser. No. 625,488

Int. Cl.³ H01H *37/70*

U.S. Cl. 337—49 **14 Claims**





1. A reduced-size thermal overload relay for a control system having a plural-phase A.C. source supplying a load comprising:

an insulating open-top housing having a plurality of narrow compartments at its lower portion and a lateral space therebelow;

a plurality of thermal responsive means for the respective phases of said system;

a plurality of conductive brackets mounted in said housing supporting said thermal responsive means so as to extend down through said compartments into said space therebelow;

a plurality of terminal leads connected to the respective brackets for connection to an external device;

a plurality of narrow cassette heaters at the top of said housing having flat heater elements mounted in insulating enclosures leaving one side of said heater elements exposed and terminals for electrically connecting said heater elements to the respective phases of said system to be heated by the currents therein;

connecting and positioning means for electrically connecting said heater elements to the respective brackets and therethrough to said terminal leads and concurrently positioning said exposed sides of said heater elements relative to the respective thermal responsive means to heat the latter according to the currents in the respective phases of said system;

a switch mounted at one side on said housing and having terminals connectable to a control device for protection of said system;

and actuator means in said space below said compartments responsive to said thermal responsive means under overload conditions for operating said switch.

4,528,540

THERMOSTAT

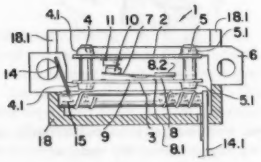
Jan J. Stiekel, Coevorden; Marinus Hagen, Enschede; Klaas H. Prins, Nijverdal, and Philips M. Gerson, Velp, all of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 14, 1984, Ser. No. 609,948

Claims priority, application European Pat. Off., Jun. 20, 1983, 832000914.6

Int. Cl.³ H01H *61/02, 37/04*

U.S. Cl. 337—102 **18 Claims**



1. A thermostat comprising a bimetal switch element reacting upon temperatures which on one of its ends is fastened on a frame and on another end is provided with an electric contact adapted to engage a fixed contact provided on the frame, characterized in that the frame comprises two mutually parallel sheet-like metallic contact carriers forming a base unit, through which two parallel ceramic pins are extending for insulating connection of both contact carriers and on which pins the contact carriers, with a tight fit, are slidable to and fro relative to one another and are maintained in permanent mutually parallel relation to each other during such slidable mounting movement.

4,528,541

BIMETAL CONTROLLED SNAP DISC THERMAL SWITCH

Walter Hollweck, Nuremberg; Kurt März, Zirndorf, and Herbert Eschenbacher, Eckenhaidt, all of Fed. Rep. of Germany, assignors to Inter Control Hermann Köhler Elektrik GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,099

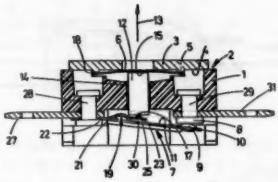
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304126

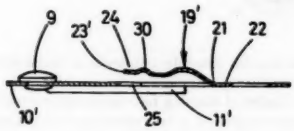
Int. Cl.³ H01H *37/52*

U.S. Cl. 337—354 **9 Claims**

1. In a bimetal controlled snap disc thermal switch for controlling the heating current to an electrical heating member, the switch including: a support plate arranged to be in thermal communication with the member; a bimetal snap disc which rests against the support plate to be in thermal communication therewith and which is formed to undergo a deformation

dependent on its temperature; a switch element supported in the housing and operable for controlling the heating current, the switch element having a fixed contact and a movable contact; a contact spring carrying the movable contact and mounted for pivotal movement in the direction of the deformation of the snap disc; a movement transfer member movable in the direction of deformation of the snap disc and interposed between the snap disc and the contact spring for acting on the contact spring with play to pivot the contact spring in a direction to separate the movable contact from the fixed contact in





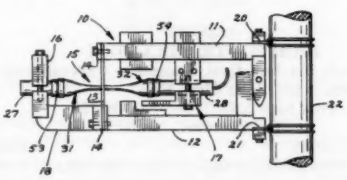
response to a deformation of the snap disc; and a compression spring bearing against the transfer member for maintaining the transfer member in operative association with the snap disc, the improvement wherein said compression spring is integral with said contact spring and is in the form of a tongue cut out of said contact spring; and said transfer member has the form of a cylindrical bolt with its axial direction oriented in the direction of deformation of said snap disc, with one end of said bolt being arranged to act on said contact spring and having a diameter which is greater than the width of the opening cut in said contact spring to form said tongue.

4,528,542

WATERPROOF STRAIN GAGE ELEMENT SYSTEM

Harry R. Meline, Minnetonka, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Oct. 13, 1982, Ser. No. 434,165
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—2 **4 Claims**



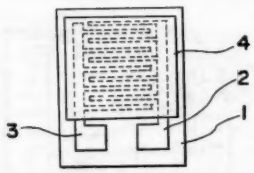
1. A strain gage assembly comprising a spring flexure member having a longitudinal axis and an outer surface, at least one bonded strain gage bonded on said member to sense strain in said member, the flexure member having opposite end portions and a flat center portion on which the strain gage is bonded, the flat center portion having a thickness defined by first surfaces and a width transverse to the thickness which is substantially greater than its thickness, the opposite end portions being of a generally cylindrical cross section shape having a transverse dimension less than the width of the center portion and greater than the thickness of the center portion, the flexure member including transition sections between the end portions and flat center portion tapering from the width of the center portion inwardly toward the end portions, and from the first surfaces outwardly toward the end portions, respectively, so that the outer surface of the flexure member has a substantially uniform peripheral length at any cross section perpendicular to the longitudinal axis, and a heat shrinkable tube of substantially uniform initial internal diameter of size to slip over the flexure member and being of sufficient length along the longitudinal axis to extend beyond the opposite ends of said strain gage and onto the opposite end portions, said tube being shrunk to size so that the inner surfaces of said tube tightly adhere to the outer surfaces of the flexure member to fluidly seal the strain gage from the exterior.

4,528,543

MOISTURE SENSITIVE RESISTIVE ELEMENT

Shuji Miyoshi, Osaka; Takashi Sugihara, Tenri, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 393,339, Jun. 29, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,384
Claims priority, application Japan, Jul. 8, 1981, 56-107292; Jul. 8, 1981, 56-107293
Int. Cl.³ H01L *7/00*; B32B *15/08*; G01N *25/64*
U.S. Cl. 338—35 **2 Claims**



1. The method of producing a moisture sensitive electrically resistive element capable of detecting and measuring moisture variations and content under ambient conditions ranging from 0 to 100% relative humidity which comprises:

providing a substrate made of electrically non-conductive material;

depositing first and second electrodes on said substrate in a spaced relationship to each other; and

depositing a moisture sensitive film comprising a polymeric material having a formula:

$$[-CH(C_6H_4SO_3X)-CH_2-]_n$$

wherein X is any one of a hydrogen atom, metal atom, ammonium, urea, triethylenediamine, tetramethyleneguanidine and hexamethylenediamine wherein n is greater than 50;

such that said resulting electrically resistive element has quick response to said broad humidity change to vary its internal ohmic resistance.

2. A method of detecting and measuring moisture variations and content under ambient conditions utilizing a highly moisture sensitive electrically resistance element which comprises:

providing a highly stable moisture sensitive electrically resistive element capable of detecting and measuring moisture variations and content under ambient conditions ranging from 0 to 100% relative humidity comprising a substrate made of electrically non-conductive material, first and second electrodes superimposed on said substrate in a spaced relationship to each other and a moisture sensitive film comprising a polymeric material having a formula:

$[-CH(C_6H_4SO_3X)-CH_2-]_n$

wherein X is any one of a hydrogen atom, metal atom, ammonium urea, triethylenediamine, tetramethyleneguanidine and hexamethylenediamine wherein n is greater than 50; and

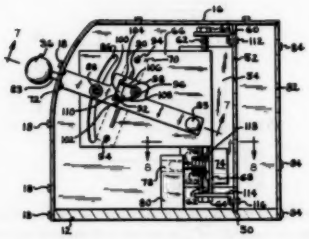
introducing said element into a moisture variable environment, said electrically resistive element responding quickly to said broad humidity range to vary its internal ohmic resistance.

4,528,544

CONTROL APPARATUS FOR VARIABLE SPEED REVERSIBLE MOTOR

Richard W. Mattson, Rossford, Ohio, assignor to Allied Corporation, Southfield, Mich.

Filed Sep. 12, 1983, Ser. No. 530,936
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—78 **6 Claims**



1. A control unit for an electrical device, comprising:

potentiometer means for controlling the voltage applied to said electrical device;

switch means for reversing the polarity of said voltage;

housing means for mounting said potentiometer means and said switch means;

said housing means including pivotally mounted support means for mounting said potentiometer means and a first portion of said switch means and restraining means for restraining a second portion of said switch means from movement when said support means is moved about a pivot means to operate said switch means;

said support means being mounted on said pivot means;

an actuating lever means attached to said potentiometer means for operating said potentiometer means;

said actuating lever means extending through a U-shaped slot defined by an exterior surface of said housing means and moveable therein;

said U-shaped slot having a bight portion and a first side portion and a second side portion;

said potentiometer means being operated to control said voltage as said actuating lever means is manually moved in said U-shaped slot;

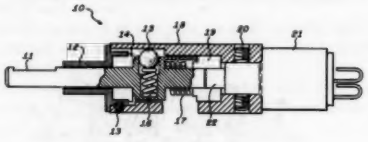
said switch means being operated to a first position when said actuating lever means is disposed in said first side portion of said U-shaped slot and being operated to a second position when said actuating lever means is disposed in said second side portion of said U-shaped slot to control the polarity of said voltage.

4,528,545

MULTI-POSITION RETURN TO CENTER POTENTIOMETER

Warren R. Lang, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 26, 1984, Ser. No. 574,756
Int. Cl.³ H01C *1/02;* **H01H** *19/58, 9/28, 27/06*
U.S. Cl. 338—184 **1 Claim**



1. An apparatus for providing detents in multi-position potentiometers consisting essentially of:

a hollow cylindrical housing having an inner surface with a first arcuate region of a first constant radius about a first center traversing a predetermined angular range, a second arcuate region with first and second sections having a second constant radius about said first center greater than said first radius, symmetrically positioned about a dimple and a curved first and second transition region with constant equal radii about second and third centers connecting said first and second arcuate regions respectively,

a cylindrical shaft positioned to rotate within said housing and,

means within said shaft for providing pressure contact with said inner surface, whereby a greater resistance to rotation is realized in one direction of rotation than in an opposite direction in said transition regions said shaft has a slot therein having top and bottom and pressure means including: a spring having a first end in contact with said bottom of said slot, a ball in contact with second end of said spring substantially contained at the top of said slot providing compression for said spring, and in pressure contact with said inner surface, and a spring wound concentrically around said cylindrical shaft for rotating said shaft, from an off-set position, until said ball is disposed adjacent to said dimple.

4,528,546

HIGH POWER THICK FILM

Mark A. Paoli, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 2, 1983, Ser. No. 490,758
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—195 **6 Claims**

1. A thick film trimmable high voltage spike resistant resistor comprising:

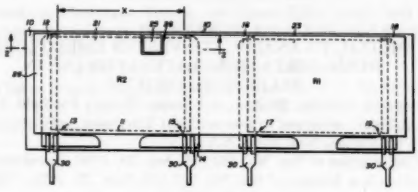
an insulating substrate;

a pair of spaced apart electrical connections affixed to the substrate;

a region of electrically resistive material coated on the substrate and not in physical contact with either of the pair of spaced apart electrical connections, the region of electrically resistive material being adapted to be trimmed along an edge to thereby increase its resistance;

a pair of spaced apart strips of electrically conductive material on the substrate each in physical and electrical contact with the region of electrically resistive material and ex-

tending to a respective one of the pair of spaced apart electrical connections, the strips being substantially parallel where in contact with the resistive material except at the ends of the strips opposite the edge adapted to be



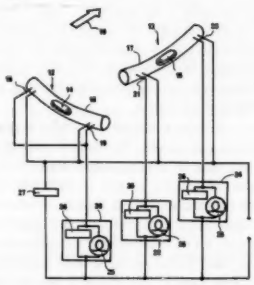
trimmed where the strips are closer together, thereby placing the highest electric field away from the edge adapted to be trimmed whereby the electric field effect of a high voltage spike is minimized.

4,528,547

DRIVING HABIT MONITOR AND SENSOR THEREFOR

Peter W. Rodney, 66 Elmcrest Rd., Etobicoke, Ontario, Canada M9C 3R9

Filed Jun. 28, 1983, Ser. No. 507,072
Claims priority, application Canada, Jun. 2, 1983, 429488
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—52 R **20 Claims**



1. Sensor for a driving habit monitor for a vehicle, comprising:

a sealed tube assembly;

a blob of mercury contained within the tube assembly;

where the tube assembly includes a length of plastic tubing which is formed as a nominally straight cylindrical shape, and where the plastic material is such that the length of tubing is bendable;

where the tube assembly is bent to form a central curved portion and two arms that slope away, and upwards, from the central curved portion;

two pairs of electrical contacts, the pairs being disposed respectively one pair to each of the arms;

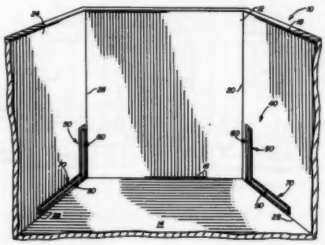
where the tube assembly is set so that the blob normally resides in the central curved portion, but the blob moves along one of the arms and bridges the contacts in that arm when the vehicle is subject to an excessive G-level.

4,528,548

VALIDITY SIGNAL APPARATUS FOR MONITORING A LINE BOUNDARY

Stephen L. Oberan, Glendale, Ariz., assignor to Daniel R. Oberan, Scottsdale, Ariz.

Filed Sep. 29, 1982, Ser. No. 426,989
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—323 R **9 Claims**



1. Validity signal apparatus for monitoring a line boundary of a playing court to determine the validity of an occurrence at the line boundary being monitored, comprising, in combination:

first light source means for providing light in a first plane substantially perpendicular to the line boundary at the line boundary being monitored;

first light receptor means for receiving the light provided by the first light source means and for providing a first signal in response to the light received; and

second light source means for providing light in a second plane substantially perpendicular to the first plane at the line boundary being monitored;

second light receptor means for receiving the light provided by the second light source means and for providing a second signal in response to the light received;

timing and logic means for receiving the first and second signals, including

first detector means for detecting the interruption of the signal from the first light receptor means in response to the interruption of the light between the first light source means and the first light receptor means and for providing a blocking signal in response thereto,

second detector means for detecting the interruption of the signal from the second light receptor means in response to the interruption of the light between the second light source means and the second light receptor means and for providing an output signal in response thereto, and

timing means for receiving the output signal from the second detector means and for receiving the blocking signal from the first detector means and for providing a signal in response to the output signal from the first detector means unless the blocking signal is received within a predetermined time period prior to receiving the signal from the second detector means.

4,528,549

BIPOLAR DIGITIZER HAVING COMPRESSION CAPABILITY

James E. Simpson, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

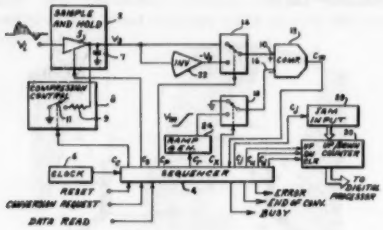
Filed Jan. 27, 1983, Ser. No. 461,426
Int. Cl.³ H03K *13/20*
U.S. Cl. 340—347 AD **8 Claims**

6. A bipolar analog to digital comparator comprising:

a sample and hold circuit including a signal storage capacitor,

a ramp voltage generator,

a comparator having first and second inputs and an output,
a signal inverter connected to the output of said sample and hold circuit,
a first switch selectively connecting either the output of said sample and hold circuit or the output of said signal inverter to the first input of said comparator,



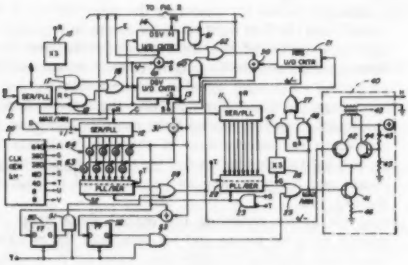
a second switch selectively connecting either a ground reference potential or said ramp voltage generator to the second input of said comparator.
a sequencer circuit controlling the operation of said first and said second switch and receiving output signals from said comparator,
and a digital up/down counter coupled to said sequencer circuit.

4,528,550

METHOD AND APPARATUS FOR CODE CONVERSION OF BINARY OF MULTILEVEL SIGNALS

Alan F. Graves, Sherwood Park, and James E. Dilley, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 31, 1983, Ser. No. 546,877
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **2 Claims**



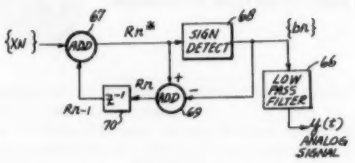
1. A code converter comprising:
means for converting blocks of binary bits into words each having multilevel symbols, the words being grouped into frames having interleaved symbols from each of the words, each frame including an additional multilevel symbol;
a running digital sum counter for determining the running digital sum of the symbols of all prior frames;
a digital sum variation counter for determining the digital sum variation of the words of each frame;
means responsive to the running digital sum and the digital sum variation counter for selectively inverting an entire frame to minimize the accumulated running digital sum of the prior frames and the selected frame;
characterized by:
transition state sum counters for determining the transition state sum of adjacent symbols of the words;
means responsive to the transition state sum for selectively inverting each word relative to the other word so as to maximize the sum of the transition states between adjacent symbols of the words in each frame; and
means for utilizing the states of the additional multilevel symbol to indicate the selective inversion of the words relative to each other, and the selective inversion of the entire frame.

4,528,551

DIGITAL TO ANALOG CONVERTER EMPLOYING SIGMA-DELTA MODULATION FOR USE IN TELEPHONE SYSTEMS

Bhagwati Agrawal, Shelton, and Kishan Shenol, Fairfield, both of Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 192,155, Sep. 29, 1980, abandoned, which is a division of Ser. No. 098,103, Nov. 28, 1979,. This application Mar. 29, 1982, Ser. No. 362,806
Int. Cl.³ H03K *13/22*
U.S. Cl. 340—347 DA **13 Claims**



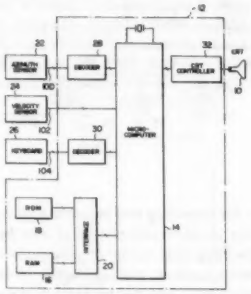
1. A sigma-delta digital to analog converter for converting a digital signal to an analog signal, said digital signal having a given word rate and comprising a plurality of digital words each having the same number of given bits, and each digital word being indicative of the weighted value of said analog signal, with at least one bit in each digital word being a sign bit indicating whether said digital word and therefore said weighted value of said word is a positive value or a negative value with respect to a given digital signal level comprising:
first adding means having an output, a first input for receiving each of said digital words serially according to said given word rate and a second input to receive an error correcting signal to provide at said output modified digital words, each having a sign bit indicative of a remainder of a preceding digital word;
sign detecting means coupled to said output of said first adding means responsive to each of said modified digital words to provide an output signal therefrom including an output pulse of one bit length to indicate when said sign bit of each of said modified words indicates one of said positive value and said negative value and no output pulse when said sign bit of each of said modified words indicates the other of said positive value and said negative value;
feedback control means including a second adding means having an output, a first input coupled to said output of said first adding means and a second input coupled to the output of said sign detecting means to invert said output signal of said sign detecting means and to add said inverted output signal of said sign detecting means to said modified digital words at said output of said first adding means to provide said correcting signal and delay means coupled between said output of said second adding means and said second input of said first adding means to couple said correcting signal to said first adding means to cause each successive digital word applied to said first input of said first adding means to be modified to provide said modified digital words whereby each successive digital word received by said first adding means is modified by said correcting signal based on said sign bit of said preceding digital word to cause said sign detecting means to provide said output signal for each of said modified digital words and

low pass filter means coupled to the output of said sign detecting means for providing a replica of said analog signal from said output signal of said sign detecting means.

4,528,552
TRAVEL LOCUS DISPLAY DEVICE

Masakazu Moriyama, Toyota, and Takao Saito, Aichi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 9, 1982, Ser. No. 386,760
Claims priority, application Japan, Jun. 15, 1981, 56-91965
Int. Cl.³ G08B *25/00*; **G08G** *1/12*
U.S. Cl. 340—525 **8 Claims**



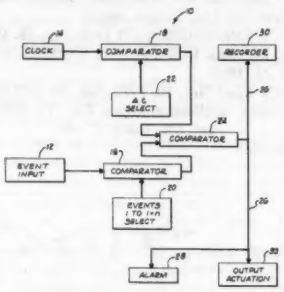
1. A travel locus display device comprising:
a display unit such as CRT for displaying a destination point and a travel locus of a vehicle from a coordinate origin as a start point in a coordinate display area on a display screen;
an azimuth sensor for sensing an azimuth of the vehicle;
a travel distance sensor for sensing a travel distance of the vehicle; and
a display control unit for controlling said display unit in accordance with an azimuth detection signal, a travel distance detection signal, an azimuth data and a distance data to the destination point supplied thereto, and for selecting one of four quadrants to which the destination point belongs based on said azimuth data, to cause said quadrant selected to be displayed over a substantially entire area of said coordinate display area and portion of other quadrants adjacent to said display quadrant to be displayed on the remaining area of said coordinate display area.

4,528,553
EVENT DETECTION APPARATUS

Ray D. Hastings, Los Alamos, N. Mex., and Ernest W. Boyer, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 16, 1983, Ser. No. 524,015
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—526 **6 Claims**

1. Apparatus for developing an event and time variable electrical signal alarm indication, comprising:
means responsive to a selected surveillance condition to produce one or more random event signals;
first counter means receiving said event signals at the input and producing an event count output upon receiving a selected number 1+n of said event signals;
clock means outputting time reference pulses;
flip flop means energized by the first one of said event signals to produce a set output;
gate means receiving time reference pulses and enabled by said set output to output said time reference pulses;
second counter means counting said gated time reference pulses and producing an enabling pulse for a selected duration;



AND gate means enabled by said selected duration enabling pulse from said second counter means to output any event count output from said first counter means; and
alarm means responsive to said event count output.

4,528,554
SIGNAL LIGHT FOR FISHING RODS AND TIP UPS

Robert J. Klefbeck, 3 Dresden Ct., Albany, N.Y. 12203

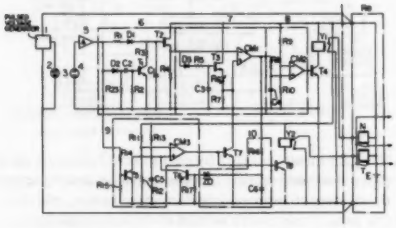
Filed Nov. 1, 1982, Ser. No. 417,901
Int. Cl.³ G08B *21/00*; **A01K** *97/00*
U.S. Cl. 340—573 **16 Claims**

1. A signal light for attachment to a fishing rod or tip-up, comprising:
an elongated housing having an opening at each end;
a light bulb for indicating the presence of a hooked fish, the light bulb residing at one end of the housing;
means located within said housing for powering the light bulb;
electrical circuit means for providing an interruptible electrical circuit between the powering means and the light bulb;
a plug removably inserted into the end of the housing opposite from that in which the light bulb resides, such that insertion of the plug into the housing causes an interruption in said electrical circuit, and removal of the plug from the housing results in a completion of said electrical circuit, energizing the light bulb; and
means for removing the plug from the housing when a fish is hooked.

4,528,555
LIGHT EXTINCTION SMOKE DETECTOR

Makoto Yasukawa, and Kenji Ishii, both of Tokyo, Japan, assignors to Cerberus AG, Männedorf, Switzerland and Nohmi Bosai Kogyo Co. Ltd., Tokyo, Japan

PCT No. PCT/EP82/00259, § 371 Date Jun. 29, 1983, § 102(e) Date Jun. 29, 1983, PCT Pub. No. WO83/02187, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 10, 1982, Ser. No. 525,036
Claims priority, application Japan, Dec. 11, 1981, 56-199721
Int. Cl.[3] G08B *17/10*
U.S. Cl. 340—630 3 Claims

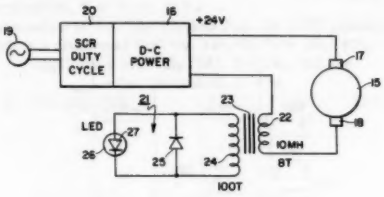


1. A light extinction type fire detector, comprising:
a pulsed light-emitting element for emitting pulsed light;
a photoelectric element for generating an output signal in response to light received from said transmitter;
a transmission measurement path for the passage of smoke of a fire to be detected extending between said pulsed light-emitting element and said photoelectric element;
a light path extending from said pulsed light-emitting element across said transmission measurement path to said photoelectric element;
the pulsed light emitted by said pulsed light-emitting element being attenuated by the smoke passing through said transmission measurement path;
a fire-detection circuit connected with said photoelectric element for discriminating whether said output signal of said photoelectric element is lower than a predetermined threshold value and for generating a fire-detection signal when said output signal of said photoelectric element is lower than said predetermined threshold value;
a false-alarm-prevention first time-delay circuit connected with said fire-detection circuit for generating a fire-alarm output signal when said fire-detection circuit generates said fire-detection signal for a first predetermined duration of time;
a second time-delay circuit connected with said fire-detection circuit for generating an inhibit signal when said fire-detection circuit generates said fire-detection signal for a second predetermined duration of time;
said first duration of time being at least as great as said second duration of time;
a light-path-interruption discriminating circuit connected with said photoelectric element for generating a light-path-interrupted signal when said output signal of said photoelectric element is lower than a predetermined threshold value for a third predetermined duration of time;
said third predetermined duration of time being less than said first predetermined duration of time and less than said second predetermined duration of time;
first inhibiting circuit means connected with said light-path-interruption discriminating circuit and with said second time-delay circuit for preventing said light-path-interruption discriminating circuit from generating said light-path-interrupted signal when said second time-delay circuit generates said inhibit signal; and
second inhibiting circuit means connected with said fire-detection circuit and with said light-path-interruption discriminating circuit for preventing said fire-detection circuit from generating said fire-detection signal when said light-path-interruption discriminating circuit generates said light-path-interrupted signal.

4,528,556
DEFECTIVE MOTOR BRUSH DETECTOR

Edward L. Maddox, Lexington, Mass., assignor to Leesona Corporation, Warwick, R.I.

Filed Feb. 14, 1983, Ser. No. 465,835
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—648 10 Claims

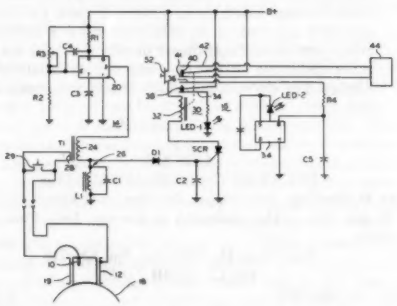


1. Apparatus for detecting and indicating faulty operation of an electric motor or generator provided with brush type sliding contacts coupling said motor or generator to a source of power comprising, current sensing means including the primary of a transformer connected between said source of power and said contacts and operable to derive impulse type signals caused by faulty operation of said contacts, and signal means connected to said current sensing means and actuated in response to said impulse type signals to provide an output signal.

4,528,557
BRUSH WEAR INDICATOR

Kenneth E. Braun, Milwaukee, Wis., assignor to Helwig Carbon, Inc., Milwaukee, Wis.

Filed Apr. 23, 1982, Ser. No. 371,507
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—648 10 Claims



1. A brush wear indicator including a probe associated with a brush, a normally open signal circuit, said probe being constructed and arranged to complete said signal circuit when said brush is worn to a predetermined degree,
a trigger circuit including an oscillator for providing a trigger signal at a preselected frequency and an impedance circuit coupled to said oscillator and tuned to the frequency thereof,
an indicating circuit operative to provide a brush wear indication,

a switching circuit coupled to said trigger circuit and to said indicating circuit,

said trigger circuit also including an inductive device in circuit between said oscillator and said switching circuit, said inductive device being unsaturated to provide a high impedance to the trigger signal when said signal circuit is open, said inductive device being saturated on the completion of said signal circuit to provide a low impedance to the trigger signal,

said switching circuit being operable to actuate the indicating circuit upon the receipt of a trigger signal.

4,528,558

DOOR-OPEN ALARM DEVICE FOR A REFRIGERATING APPLIANCE

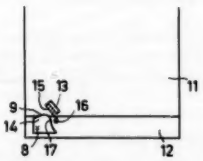
Michel Steers, Chennevieres-sur-Marne; Jean-Pierre Hazan, and Michel Courdille, both of Sucy-en-Brie, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,897

Claims priority, application France, Jul. 9, 1981, 81 13546

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—686 **16 Claims**



1. A door-open alarm device for a household appliance provided with a door and a stationary part on which the door is movably mounted, said device comprising: arranged on the stationary part of the appliance, alarm means connected to an electric circuit comprising a voltage source, a switch having first and second positions which correspond to the electric circuit being interrupted and closed respectively, electrical means providing a time delay in response to a current flow in the electric circuit and after a time delay producing a voltage variation across said alarm means, thereby triggering said alarm means and, arranged on the door, a mechanical actuating element for operating said switch, said actuating element opening said switch when the door is wide open or closed, and closing said switch when the door is ajar.

4,528,559

SEISMIC ACTUATION SYSTEM

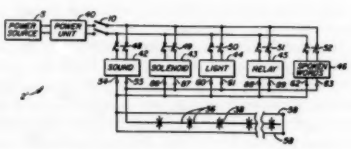
Albert J. Freeman, 58 Milland Dr., Mill Valley, Calif. 94941

Continuation-in-part of Ser. No. 251,585, Apr. 6, 1981, Pat. No. 4,408,196. This application Jul. 1, 1983, Ser. No. 510,466

The portion of the term of this patent subsequent to Nov. 4, 2000, has been disclaimed.

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—690 **18 Claims**



1. A seismic actuation system comprising:

a plurality of motion sensors, each said sensor comprising:

a weight;

a housing for movably maintaining said weight within said housing parallel to an internal dimension, said weight including a depending positioning tab and said housing including a slot through which said tab extends to allow said weight to be positioned along said internal dimension; and

electric contacts operable by said weights being displaced from a central position along said internal dimension;

means for adjustably mounting said motion sensors in a generally horizontal plane, said motion sensors being positioned at various angles to one another;

an electrically actuated device electrically coupled to said electric contacts; and

means for powering said electrically actuated device when one or more of said weights have been displaced from said central position as a result of a seismic event.

4,528,560

METHOD OF CURSOR CONTROL FOR ENABLING ALL TEXT IN WORKING MEMORY TO BE DISPLAYED WELL IN ADVANCE OF REPRODUCTION OF EDITING

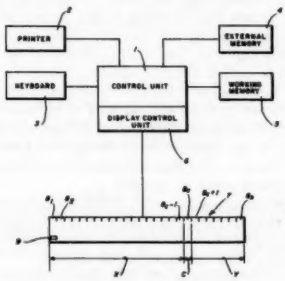
Franz Bergermann, Fürth, and Michael Prüfer, Cadolzburg, both of Fed. Rep. of Germany, assignors to Triumpf-Adler A.G. für Büro und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 437,901, Nov. 1, 1982, abandoned. This application Dec. 27, 1984, Ser. No. 685,608

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151357

Int. Cl.³ G09G *3/00*

U.S. Cl. 340—709 **3 Claims**



1. In a text writing machine having a working memory for storing symbols of a text and a line display for displaying, in order, a predetermined number of the text symbols stored in said working memory, and having a display control unit for generating a cursor to sequentially indicate the positions on the display containing text symbols to be processed in response to a cursor control command, a method for controlling said cursor to enable all of the symbols stored in said working memory to be displayed comprising the steps of,

indexing said cursor from the first position on the display toward the last position on the display in response to cursor control commands,

establishing a given display position intermediate said first and last display positions,

determining when said cursor has reached said given position,

determining whether the last symbol of text stored in working memory appears on said display,

continuing indexing of said cursor, responsive to said cursor control commands, to said last position if the last symbol in working memory appears on said display, and

holding said cursor at said given position if the last symbol in working memory does not appear on the display, and

shifting the displayed symbols toward the first display position in response to subsequent cursor control commands

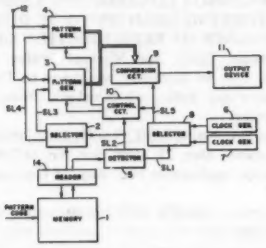
until it is determined that said last symbol in said working memory appears in the last display position, and then resuming indexing said cursor said last position in response to subsequent cursor control commands.

4,528,561

INFORMATION OUTPUT DEVICE FOR RECORDING INFORMATION WITH VARIED RESOLUTION

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1981, Ser. No. 288,785
Claims priority, application Japan, Aug. 11, 1980, 55-110005
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—745 **5 Claims**



1. An information output device, comprising:

(a) input means for inputting in said device an information signal representing dot patterns to be output, and an instruction signal for instructing which of the dot patterns should be output in a first resolution for a first area of one image field and in a second resolution different from the first resolution for a second area of the same image field;

(b) first pattern generating means for generating a first dot pattern in the first resolution by applying the information signal thereto, said first dot pattern corresponding to the information signal as applied;

(c) second pattern generating means for generating a second dot pattern in the second resolution by applying the information signal thereto, said second dot pattern corresponding to the information signal as applied;

(d) means for applying the information signal to said first pattern generating means when the instruction signal instructs the first resolution, and for applying the information signal to said second pattern generating means when the instruction signal instructs the second resolution; and

(e) circuit means for receiving the first and second dot patterns from said first and second pattern generating means and for outputting a received dot pattern as a plurality of lines, each of which lines is output sequentially at first and second rates for the first and second dot patterns, respectively, to be able to form dot patterns with different resolutions in the same image field.

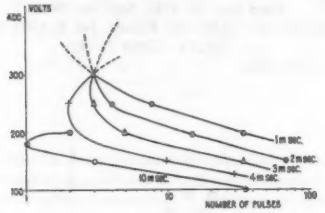
4,528,562

CO-ORDINATE ADDRESSING OF SMECTIC DISPLAY CELLS

William A. Crossland, Harlow; David Coates, and Peter J. Ayliffe, both of Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Division of Ser. No. 219,559, Dec. 23, 1980, Pat. No. 4,419,664. This application Aug. 25, 1983, Ser. No. 526,563
Claims priority, application United Kingdom, Jan. 16, 1980, 8001499
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—805 **12 Claims**

1. A method of co-ordinate matrix addressing an internally electroded liquid crystal display cell which has a layer of smectic material sandwiched between two electroded plates with a first array of electrodes on one of the plates crossing over a second array on the other plate thereby defining a set of elemental volumes, each individual element being defined by the thickness of the liquid crystal layer and the area of overlap between a member of the first array and a member of the second array, the smectic material being capable of producing dynamic scattering in response to the application of a first electric potential having a first set of predetermined characteristics and of maintaining static focal-conic scattering subsequent to the application and removal of said first potential, said cell being further provided with means for selectively restoring said smectic material in a selected one of said set of elemental volumes to a non-scattering substantially homeotropically aligned state in response to the application of a second electric potential having a second set of predetermined characteristics between the two electrodes defining said selected elemental volume, said method comprising:



(a) applying said first potential to said set of elemental volumes so as to cause dynamic scattering therein;

(b) removing said first potential to thereby cause said static focal-conic scattering in said set of elemental volumes;

(c) restoring selected ones of said elemental volumes to said non-scattering substantially homeotropically aligned state by sequentially applying said second electrical potential to corresponding ones of said electrodes; and

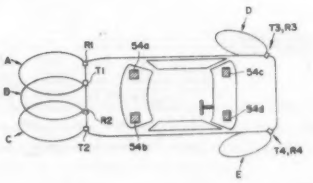
(d) interrupting step (c) by applying a "blanking" potential having a third predetermined set of characteristics simultaneously to all of said set of elemental volumes to re-initiate dynamic scattering in the unselected ones of said elemental volumes while leaving previously restored ones of elemental volumes in said non-scattering substantially homeotropically aligned state.

4,528,563

REARWARD OBSTRUCTION SENSING SYSTEM FOR AUTOMOTIVE VEHICLE

Mikio Takeuchi, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 24, 1983, Ser. No. 544,775
Claims priority, application Japan, Nov. 11, 1982, 57-196707
Int. Cl.³ G08G *1/00*
U.S. Cl. 340—903 **11 Claims**



1. A rearward obstruction sensing system for an automotive vehicle including a vehicle body, a passenger compartment, a gear shift lever and a car audio set, which comprises:

(a) means for intermittently and sequentially transmitting plural obstruction sensing signals from near each corner of

the vehicle body for enabling detection of obstructions existing within plural warning areas near the vehicle, each of said warning areas being defined by said transmitted signals;

(b) a plurality of means for receiving the obstruction sensing signal transmitted from said transmitting means and reflected from obstructions existing within the warning areas, each of said receiving means being arranged near the corners of the vehicle body being mated with each of said transmitting means;

(c) means for controlling said transmitting means and said receiving means, said controlling means intermittently and sequentially supplying an intermittent output command signal to said transmitting means to cause the intermittent obstruction sensing signal to be sequentially transmitted from said transmitting means so as to enable derivation of a reflected signal to be received by the receiving means, said controlling means calculating obstruction distances on the basis of the difference between the time when the sensing signal is transmitted and the time when the sensing signal is received and the sensing signal propagation speed, and said controlling means further deriving intermittent obstruction distance signals having a period which varies as a monotonic function of the detected obstruction distance; and

(d) means for generating plural intermittent aural alarm signals, one of said aural alarm signals being generated in response to said controlling mens detecting the presence of any obstructions within any of the warning areas, each of said aural alarm signals being allocated to each of the warning areas respectively and originating near each corner of the passenger compartment so as to be propagated from the direction of the allocated warning areas respectively toward the driver's position;

said transmitting means including four separate transmitting transducers, said receiving means including four separate receiving transducers and said alarm generating means including four separate aural transducers, a first pair of the transmitting and receiving transducers being disposed near the rear, left side corner of the vehicle body, a second pair of the transmitting and receiving transducers being disposed near the rear, right side corner of the vehicle body, a third pair of the transmitting and receiving transducers being disposed near the front, left side corner of the vehicle body, a fourth pair of the transmitting and receiving transducers being disposed near the front, right side corner of the vehicle body, and a first of the aural transducers being disposed near the rear, left side corner of the passenger compartment, a second of the aural transducers being disposed near the rear, right side corner of the passenger compartment, a third of the aural transducers being disposed near the front, left side corner of the passenger compartment, and a fourth of the aural transducers being disposed near the front, right side corner of the passenger compartment;

said first transmitting, receiving and aural transducers being alocated to a first warning area A defined near the rear, left side of the vehicle body, said first and second transmitting, receiving and aural transducers being allocated to a second warning area B defined near the rear, middle portion of the vehicle body, said second transmitting, receiving and aural transducers being allocated to a third warning area C defined near the rear, right side of the vehicle body, said third transmitting, receiving and aural transducers being allocated to a fourth warning area D defined near the front, left side of the vehicle body, and said fourth transmitting, receiving means and aural transducers being allocated to a fifth warning area E defined near the front, right side of the vehicle body;

whereby the driver can recognize the direction and the distance of an obstruction existing within dead angles from the driver sensorially, without watching a display device.

4,528,564

WARNING DEVICE FOR HELICOPTERS

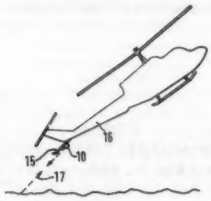
Ulrich Trampnau, Ungererstrasse 19, 8000 Munich 40, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 517,941

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228557

Int. Cl.³ G08G *5/00*

U.S. Cl. 340—946 **8 Claims**



1. A warning device, for a helicopter with a tail rotor and a tail rotor mechanical protection device, which device produces a warning signal when the tail is in such a position as to be in danger of making contact with an obstruction or the ground and comprises a height-measuring device with transmitting and receiving means for a high frequency electromagnetic wave beam used in the height measurement, the transmitting and receiving means being positioned at the tail of the helicopter such that the electromagnetic wave beam is directed backwards and obliquely downwards, and computing means for determining from the height measurements of the height measuring device, the speed of approach to the ground or obstruction in the path of the beam and for initiating a warning signal if the speed of approach relative to the instantaneous height corresponds to a predetermined value.

4,528,565

PULSE DOPPLER RADAR RECEIVER WITH A CIRCUIT FOR REDUCING SPURIOUS SIGNALS

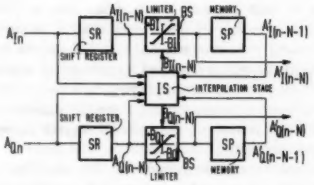
Rudolf Hauptmann, Dachau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,769

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1981, 3116612

Int. Cl.³ G01S *7/28*

U.S. Cl. 343—17.1 R **7 Claims**



1. A pulse Doppler radar receiver for receiving radar video signals with apparatus for a large number of range channels and moving target filters and comprising, rectifier arrangements for detecting the radar video signals and in which said radar video signals are supplied to an evaluation means through a postdetection-integration circuit (**10**) and a video threshold circuit (**11**) including an interpolation circuit (**9**) for limiting and substituting individual, generated corrected amplitude signals for disrupted signals which are in error due to their

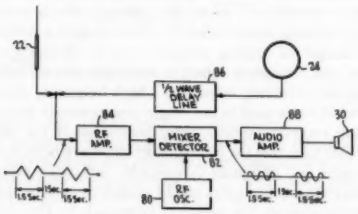
amplitude variations and which includes an interpolation stage (IS), said interpolation stage being connected between said rectifier (8) and said postdetection-integration circuit (10), and said interpolation circuit (9) including a shift register (SR) and a limiter (BS) between its input and its output in a first of two circuit branches which are connected in parallel and including an interpolation stage (IS) and a memory (SP) in a second of said two circuit branches; and said limiter (BS) is controlled with an output from said interpolation stage (IS) which varies as a function of the inputs to said interpolation circuit so as to prevent extreme variations of video signals.

4,528,566

TRANSMITTER AND RECEIVER LOCATING DEVICE

Michael D. Tyler, 4 Elm St., Richwood, W. Va. 26261

Filed Aug. 13, 1982, Ser. No. 407,937
Int. Cl.³ G01S *5/04*
U.S. Cl. 343—419 **11 Claims**



1. A directional locating device, comprising:

means for transmitting radiating RF signals at a stabilized frequency and carried by an object the direction of which is to be determined from a distance remote therefrom;

receiver means located remotely from said transmitting means for receiving said radiated RF signals to provide indication of the direction to said transmission means, and comprising a sense antenna and a directional antenna;

said receiver means comprising:

a one-half wave delay line responsive to the signal detected by said directional antenna for generating a **180** degree out-of-phase signal with respect to the signal detected by said sense antenna;

said directional antenna is a loop antenna;

a variable inductance coupling transformer having a primary winding connected directly to said sense antenna and the output of said one-half wave delay line to produce at a secondary winding of said transformer a summation signal representing the summation of said 180 degree out-of-phase signal and the signal detected by said sense antenna;

RF amplifying means for amplifying said summation signal;

oscillation means for generating a second stabilized RF signal at a different frequency than the RF signals radiated by said transmitting means;

mixer detector means responsive to the amplified summation signal and said second stabilized RF signal to generate an AF signal indicative of the direction of said transmitter means from said receiver when said directional antenna is rotated to any given position relative to said transmitting means;

amplifying means for amplifying said AF signal; and

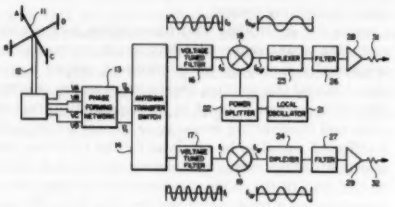
a speaker connected to receive said amplified AF signals for generating audible and non-audible signals, the latter being indicative of the direction of said transmitter means from said receiver.

4,528,567

RADIO SIGNAL RECEIVING SYSTEM

Thomas P. Miles, Palo Alto, and Richard A. Koenen, Cupertino, both of Calif., assignors to Argo Systems, Inc., Sunnyvale, Calif.

Filed Aug. 10, 1981, Ser. No. 291,617
Int. Cl.³ G01S *5/04*
U.S. Cl. 343—442 **5 Claims**



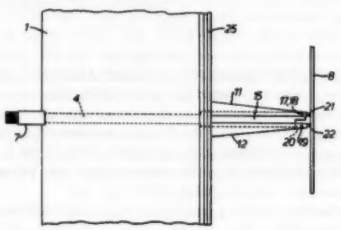
1. A radio signal direction finding system comprising an antenna array, a phase forming network connected to the antenna array and providing two output signals having a phase difference which is indicative of the signal direction, a pair of matched compressive receivers each connected to receive one of said output signals and provide a pair of compressed output pulses for each received signal, and phase detector means for receiving said compressed pulses and determining the relative phase of the carrier signal in said compressed pulses and provide output signals representative of the phase differences.

4,528,568

SLOTTED DIPOLE WITH THREE LAYER TRANSMISSION LINE FEED

Edmund W. Woloszczuk, Chelmsford, England, assignor to The Marconi Company Limited, Stanmore, England

Filed Jan. 12, 1983, Ser. No. 457,453
Claims priority, application United Kingdom, Jan. 15, 1982, 8201084; Jun. 7, 1982, 8216515; Nov. 15, 1982, 8232564
Int. Cl.³ H01Q *21/08, 9/28*
U.S. Cl. 343—816 **10 Claims**



1. An antenna including a three-layer transmission line having an elongate central conductor sandwiched between two ground planes both of which terminate in two narrow extensions thereof which are separated by two respective longitudinal slots aligned with each other and the elongate central conductor so that a pair of extensions is disposed on either side of a plane passing through the slots and central conductor, the ends of that pair of extensions lying to one side of the plane both being electrically connected to said central conductor, and the ends of the other pair of extensions being connected together; a dipole radiator comprising two co-planar plate portions spaced apart by an elongate aperture, the two plate portions being electrically connected together at each end of the elongate aperture, and a mid-point on each side of the

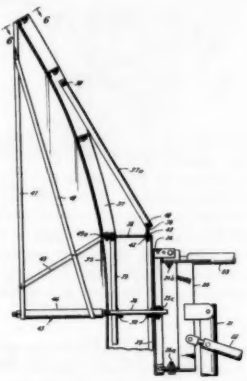
aperture being electrically connected to respective ones of said pairs of said extensions; and a planar reflector mounted at the base of said extensions so as to be substantially parallel to said dipole radiator and perpendicular to the three-layer transmission line.

4,528,569

EARTH STATION ANTENNA ASSEMBLED ON SITE

John V. Felter, P.O. Box 6474, Houston, Tex. 77008, and John G. Campsmith, 16434 Delozier, Houston, Tex. 77040

Filed Dec. 13, 1982, Ser. No. 449,396
Int. Cl.³ H01Q *15/16*
U.S. Cl. 343—840 **9 Claims**



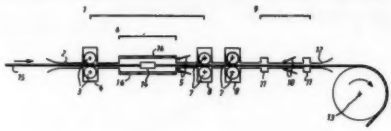
1. Earth station antenna apparatus, comprising an upright tubular polar support, a polar connection having a part rotatable in said polar support and a movable part having an inner side pivotably connected thereto and pivotally movable in a vertical plane, said movable part having a vertically slotted yoke at its outer side, a mounting bar fixed at its center through said yoke, a square base frame pivotally connected at the centers of opposite sides to opposite ends of said mounting bar whereby said frame is rotatable about said pivotal connections thereof to said mounting bar, said square base frame carrying a cylindrical mounting rod extending transversely outwardly through the center of said square base frame, a short cylindrical support tube having its axis coaxial with the axis of said mounting rod and being supported by plural diametric cross members having holes at their crossed centers through which said mounting rod is closely yet slidably and rotatably disposed, said square base frame having removably mounted below its lower side an outwardly facing roller which engages the lower inner edge of said cylindrical support tube as said support tube is rotated about said mounting rod to maintain said support tube at a fixed distance from said square base frame during assembly of the apparatus, plural arm members each curved to have an outer face of parabolic curvature, said arm members each being bolted at their inner ends to the outer edge of said cylindrical support tube and said end members being disposed equally circularly spaced about said support tube and each extending radially outward whereby said outer faces thereof define a parabolic contour, an angular brace member connected to an outer portion of each said arm member and extending angularly radially inward to terminate in an inwardly directed threaded rod fixed thereto, each said threaded rod end being received through an opening through the inner edge of said support tube axially inward from the bolt connecting the respective arm member to the inner side of said support tube, whereby nuts screwed onto said threaded rod inward and outward of the wall of said support tube may be adjusted to adjust the effective length of the angular brace member and thereby to adjust the position of the arm member to adjust said parabolic outer face thereof accurately to said parabolic contour, plural cross members connected between said arm members at each of plural distances from the axis of said mounting rod and including a distance at the outer ends of said arm members and stabilizing said arm members, having outer faces further defining said parabolic contour, said plural arm members and said cross members defining segments of said parabolic contour therebetween, and surface means fixed to said arm members and cross members around said segments to provide an antenna surface at said parabolic contour, said removably mounted roller when removed permitting rigid connection of said support tube to said square base frame after said antenna surface has been completed.

4,528,570

METHOD FOR TRANSFERRING OPTICALLY PRODUCED PICTURE RECORDS TO A MAGNETIC RECORD SUPPORT AND APPARATUS FOR PERFORMING THE METHOD

Christoph Geyer, Hamburg, and Bernd Baader, Berlin, both of Fed. Rep. of Germany, assignors to Geyer-Werke GmbH, Berlin, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,033
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1981, 3144871
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.2 **11 Claims**



5. Apparatus for transferring optically produced picture records stored on windable roll film material onto a magnetic record support by electronically processable scanning of the film material while the latter is driven in a predetermined direction at uniform speed along a film path through the apparatus comprising a rotatable capstan frictionally engaging the film material to advance the same in said predetermined direction; a scanning window chamber in advance of said capstan defining a liquid volume containing a printing liquid and bounded by opposed transparent plates, first sealing roller means through which said film path enters said scanning window chamber, and second sealing roller means through which the film path exits said chamber, said first and second sealing roller means sealing the chamber against escape of the liquid; and means causing said liquid to flow in said chamber in a direction counterflow to said predetermined direction of said film material.

4,528,571

FLUID JET PRINT HEAD HAVING BAFFLE MEANS THEREFOR

George W. Sweet, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 5, 1984, Ser. No. 586,456
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **10 Claims**

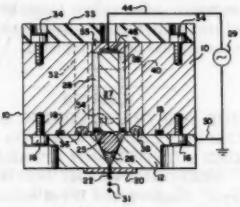
1. A fluid jet print head for producing a plurality of jet drop streams consisting of drops of uniform size and spacing, comprising:

manifold means defining an elongated slot therein having a pair of opposing side walls, said walls converging toward a first side of said manifold means,

piezoelectric means mounted on said manifold means so as to close said slot on the second side of said manifold means, opposite said first side, said piezoelectric means including

a peizoelectric transducer assembly extending along the length of said slot,

orifice plate means, mounted on said manifold means on said first side thereof so as to close said slot and define a fluid-receiving reservoir with said manifold means and said piezoelecric means, said orifice plate means defining a plurality of orifices communicating with said reservoir,



said orifices being arranged in at least one row extending parallel to and communicating with said slot, and

baffle means positioned in said fluid-receiving reservoir and contacting said walls of said slot and said piezoelectric means, said baffle means being formed of a compressible material which is compressed between said walls and said piezoelectric means.

4,528,572

THERMAL PRINTER

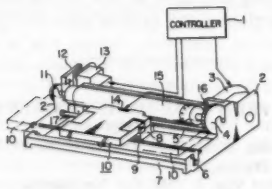
Akira Sasaki; Kazuyuki Mashiko; Shouji Saitoh, and Akiyoshi Hakoyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,784

Claims priority, application Japan, Feb. 8, 1983, 58-18222

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **5 Claims**



1. A thermal printer comprising:

a print head with a plurality of arrays of in-line thermal elements,

a carriage mounting said print head,

a controller for controlling the printing operation, and

print mode switching means which selects low-speed print mode in which one array of thermal elements is activated for each dot pitch for printing, or high-speed print mode in which the arrays are activated cyclically for every dot pitch for printing.

4,528,573

OPTICAL PRINT HEAD WITH REMOVABLE MOUNTING

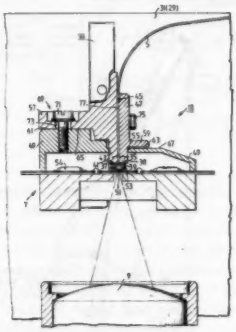
Herbert Behrens, Zetal; Rainer Marx, Wilhelmshaven, and Jürgen Schmitt, Stadtland, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 592,458

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 3310259

Int. Cl.³ G01D *9/42, 15/14*

U.S. Cl. 346—108 **23 Claims**



1. In an optical printing head for a parallel printer for the line-by-line recording of graphics and text information in successive parallel lines on a photosensitive record carrier disposed at a print location, said printing head comprising a plurality of juxtaposed actuatable light switching means, each including a light switching array and being disposed adjacent one another in the direction of a recording line, for transmitting incident light in the form of dots along the length of a line to be recorded when actuated, a respective cross section converter for conducting light from a light source to each of said light switching means, and a respective objective lens for each said light switching means to project the dots of light produced by the light switching means onto the record carrier disposed at the printing location along a portion of each printing line; the improvement further comprising: a carrier on which said plurality of switching means are mounted and which is removably mounted in said printing head; an abutment surface on said carrier, with said abutment surface extending in the direction of a line of print; means for causing an edge portion of each of said light switching means to abut said abutment surface to align said light switching means on said carrier in the direction of the line of print; and a contact surface on said carrier for said cross section converters with said contact surface being disposed such that each said cross section converter, when in contact with said contact surface, can be placed in a defined position opposite said light switching array of the associated said light switching means.

4,528,574

APPARATUS FOR REDUCING EROSION DUE TO CAVITATION IN INK JET PRINTERS

James H. Boyden, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 28, 1983, Ser. No. 479,785

Int. Cl.³ G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—140 R **14 Claims**

1. An apparatus for jetting a fluid from a reservoir through an orifice, comprising:

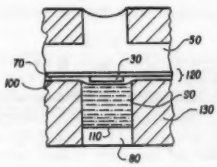
a substrate forming at least a portion of a wall of the reservoir;

a cavity in the substrate, said cavity having a terminus within the substrate;

a membrane covering the cavity;

jetting means coupled to the membrane and positioned in proximity with the cavity for producing an expansion force in the fluid; and

absorber means in the cavity and coupled to the membrane for gradually absorbing a contracting force produced in



response to the expanding force to prevent damage by the contracting force to the jetting means, said absorber means having a real component of acoustic impedance substantially the same as the real component of acoustic impedance of the fluid in the reservoir and an absorptive component of acoustic impedance different from the absorptive component of acoustic impedance of the fluid in the reservoir to substantially absorb the contracting force before said contracting force reflects from the terminus.

4,528,575

INK JET PRINTING HEAD

Tadashi Matsuda; Tsuneo Mizuno, both of Yokohama, and Noboru Takada, Inagi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

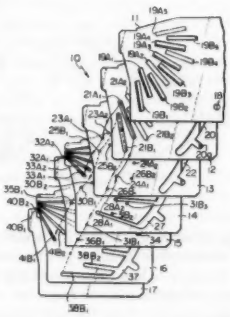
PCT No. PCT/JP81/00423, § 371 Date Aug. 27, 1982, § 102(e) Date Aug. 27, 1982, PCT Pub. No. WO82/02363, PCT Pub. Date Jul. 22, 1982

PCT Filed Dec. 28, 1981, Ser. No. 414,363

Claims priority, application Japan, Dec. 30, 1980, 55-189538

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **8 Claims**



1. A laminated ink jet printing head, comprising:

a first cover plate having inner and outer surfaces with piezoelectric elements mounted on the outer surface and having at least one ink port formed therethrough;

a pressure chamber plate, disposed adjacent to the inner surface of said first cover plate, having pressure chambers formed therethrough in alignment with the piezoelectric elements;

a second cover plate;

nozzle plates, disposed between said pressure chamber plate and said second cover plate, each of said nozzle plates having ink supply passages and ink delivery passages formed therethrough, the ink delivery passages being opened at one edge of each of said nozzle plates to provide a row of nozzles in each of said nozzle plates, the row of nozzles of one of said nozzle plates being offset with respect to the row of nozzles of an adjacent nozzle plate, each of the ink supply passages and each of the ink delivery passages corresponding to one of the pressure chambers; and

partition plates, each of said partition plates being disposed between said pressure chamber plate and one of said nozzle plates and between said nozzle plates, at least some of said pressure chamber plate, said nozzle plates and said partition plates having connecting passages formed therethrough which connect the ink port with the ink supply passages, the pressure chambers and the ink delivery passages.

4,528,576

RECORDING APPARATUS

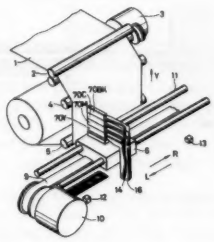
Noboru Koumura, Narashino; Nobutoshi Mitzusawa, Yokohama, and Kunitaka Ozawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,119

Claims priority, application Japan, Apr. 15, 1982, 57-61818; Apr. 15, 1982, 57-61819; Apr. 16, 1982, 57-62585; Apr. 16, 1982, 57-62586

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **8 Claims**



1. A recording apparatus comprising:

recording means reciprocatable relative to a recording medium to record an image on the recording medium;

said recording means including a plurality of recorders; and

means for selectively driving said plurality of recorders in combined sets which are different from each other in the forward and return movements of said recording means.

4,528,577

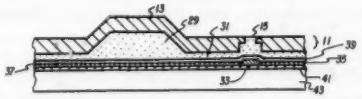
INK JET ORIFICE PLATE HAVING INTEGRAL SEPARATORS

Frank L. Cloutier; Robert N. Low, both of Corvallis; Paul H. McClelland, Monmouth, and Niels J. Nielsen, Corvallis, all of Oreg., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Nov. 23, 1982, Ser. No. 443,980

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **1 Claim**



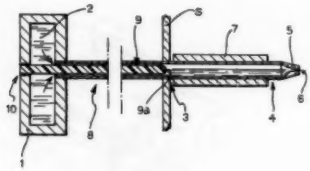
1. A thermal ink jet printhead comprising:

(1) A planar substrate member;

(2) A heat control layer disposed on said substrate member;

(3) A plurality of resistive elements disposed on said heat control layer;
(4) A plurality of electrical conductors disposed on said heat control layer and electrically connected to said resistive elements;
(5) A thin metallic planar sheet having:
(A) A plurality of orifices formed therein and disposed in a row, there being an orifice for each of said resistive elements;
(B) A plurality of integral barrier portions between said orifices and extending toward said heat control layer;
(C) An integral ink distribution manifold portion adjacent said row of orifices and said barrier portions and extending away from said heat control layer; and
(6) Means for securing said planar sheet to said substrate member with said orifices being in registration with said resistive elements, said barrier portions forming a plurality of ink supply channels from said manifold portion to said orifices.

4,528,578
INK-JET PRINTER DAMPING
Edoardo Balbo, Banchette, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Dec. 5, 1983, Ser. No. 558,301
Claims priority, application Italy, Dec. 3, 1982, 68424 A/82
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **7 Claims**



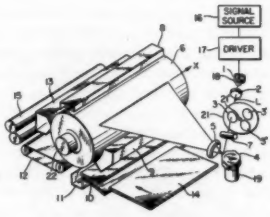
1. An ink jet printer comprising an ink reservoir, a tubular ink duct communicating at one end with said reservoir and provided at the other end with an ink projecting nozzle, said duct being made of a substantially rigid material, and a tubular transducer surrounding a first portion of said duct adjacent said nozzle for generating a first pressure wave in the ink, said first pressure wave being directed towards the nozzle to cause a droplet of ink to be discharged through the nozzle, while a second pressure wave associated with the first pressure wave is directed towards said reservoir, wherein the improvement includes an elongated cylindrical damper element located in a substantially coaxial position into another portion of said duct, as to form an annular flow chamber for the ink, said element being made of such a resilient material and being made so dimensioned that the acoustic impedance of said other portion with said damper element matches the acoustic impedance of said first portion of the duct so as to prevent said second pressure wave from reflecting toward said first portion, and that said damper element substantially absorbs the energy of said second pressure wave of the ink travelling into said annular flow chamber toward said reservoir.

4,528,579
INK-JET PRINTER DAMPING
Riccardo Brescia, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Dec. 5, 1983, Ser. No. 558,339
Claims priority, application Italy, Dec. 3, 1982, 68423 A/82
Int. Cl.³ G01D *15/18;* **H01S** *4/00*
U.S. Cl. 346—140 R **6 Claims**

1. An ink jet printer comprising an ink reservoir, a tubular ink duct including a terminal portion made of a substantially rigid material and provided with an ink projecting nozzle at one end thereof, and an intermediate portion connected at one end to said reservoir and at the other end to said other end of the terminal portion, said intermediate portion being made of a substantially viscoelastic material, and a tubular transducer surrounding at least a part of the terminal portion of the duct for generating a first pressure wave in the ink, said first pressure wave being directed towards the nozzle to cause a droplet of ink to be discharged through the nozzle, while a second pressure wave associated with said first pressure wave is directed toward said intermediate portion of the duct, the acoustic impedance of said terminal portion matching that of said intermediate portion, whereby the second pressure wave is

prevented from reflecting toward said terminal portion, wherein the improvement includes an elongated tubular container surrounding at least part of said intermediate portion of the duct and being sealed at the two ends with said intermediate portion to form an annular chamber closed at the two ends, and a viscous fluid filling said chamber, whereby said intermediate portion can deform resiliently under the action of said second pressure wave and transmit said pressure wave to said fluid, thus causing said intermediate portion to absorb the energy of said second pressure wave in a reduced length thereof before its connection with said reservoir.

4,528,580
IMAGE INFORMATION RECORDING APPARATUS
Takahiro Inoue; Kazuhiro Hirayama, both of Yokohama, and Masaharu Tsukada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 25, 1983, Ser. No. 460,826
Claims priority, application Japan, Feb. 2, 1982, 15212
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 **5 Claims**



1. An image information recording apparatus including:
a movable electrophotographic photosensitive member;
means for forming a laser beam modulated in accordance with image information to be recorded, said means including a semiconductor laser for generating said laser beam;
optical filter means for decreasing the difference between the rising peak intensity value and the steady intensity value of said laser beam emitted by said semiconductor laser;
optical scanning means for scanning the laser beam relative to said photosensitive member to form an electrostatic latent image corresponding to the image information to be recorded;
a focusing lens for focusing the laser beam on said photosensitive member; and
developing means for developing said electrostatic latent image, said optical filter means reducing the rising peak intensity value of the laser beam to I_3 and the steady

intensity value of the laser beam to I_2 corresponding to a steeply sloped area of the E-V (Exposure amount—Potential) curve of the electrophotographic photosensitive member, respectively, and having such a light transmission factor such that ΔV is within about 15% of Vc, wherein Vc is a difference between potentials of a highland area and of a lowland area of said E-V curve and ΔV is a difference between surface potentials of the photosensitive member exposed to the laser beams of the intensity I_3 and of the intensity I_2.

4,528,581

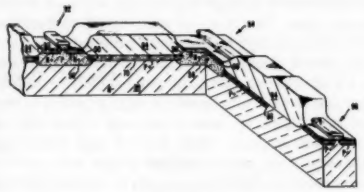
HIGH DENSITY CMOS DEVICES WITH CONDUCTIVELY INTERCONNECTED WELLS

William W. Y. Lee, Fountain Valley, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 313,395, Oct. 21, 1981, Pat. No. 4,426,766. This application Jan. 9, 1984, Ser. No. 569,064

Int. Cl.³ H01L *27/04, 29/78*

U.S. Cl. 357—23.11 **4 Claims**



1. An integrated circuit structure comprising:

(a) a semiconductor substrate of a first conductivity type, said substrate having a major surface including a plurality of first surface regions elevated above a second surface region, said elevated first surface regions being joined to said second surface region by downwardly sloped surfaces;

(b) a plurality of separate and spaced apart well regions of a second conductivity type, each underlying and adjacent to a separate said elevated first surface region, the associated downwardly sloped surfaces, and an immediately surrounding portion of said second surface region;

(c) a plurality of parasitic channel stops of said second conductivity type, each located within said substrate, adjacent to a portion of said second surface region and a contiguous portion of said downwardly sloped surface encircling a separate said elevated first surface region, a portion of each said parasitic channel stop overlapping a portion of its associated well region;

(d) a buried conductor of said second conductivity type located within said substrate and adjacent to said second surface region, said buried conductor extending between and contiguous with a plurality of said parasitic channel stops, whereby a plurality of said well regions are conductively interconnected.

4,528,582

INTERCONNECTION STRUCTURE FOR POLYCRYSTALLINE SILICON RESISTOR AND METHODS OF MAKING SAME

Simon S. Cohen, Schenectady, and Mario Ghezzo, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 21, 1983, Ser. No. 534,520

Int. Cl.³ H01L *27/02, 29/04, 23/48*

U.S. Cl. 357—51 **6 Claims**

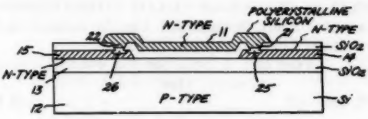
1. In combination,

a pair of conductive members of silicon semiconductor material of N-type conductivity and of low resistivity,

a layer of insulating material overlying said conductive members of silicon,

a pair of openings in said layer of insulating material exposing respective portions of said conductive members of silicon,

a pair of conductive barrier layers, each barrier layer constituted of a silicide of a metal selected from the group consisting of platinum, palladium and nickel, each barrier layer situated in a respective one of said openings and each



making contact with a respective exposed portion of said conductive members,

a body of polycrystalline silicon of said N-type conductivity and of high resistivity overlying said insulating layer and having a pair of end portions, each end portion contacting a respective one of said barrier layers,

each conductive barrier layer providing a barrier to the diffusion of N-type conductivity determining dopants from said conductive members of silicon into said body of polycrystalline silicon.

4,528,583

PROGRAMMABLE SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME

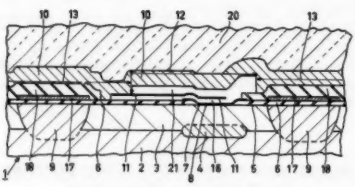
Ties S. te Velde, and Arie Slob, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 258,113, Apr. 27, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 601,894

Claims priority, application Netherlands, May 8, 1980, 8002635

Int. Cl.³ G11C *11/40;* **H01L** *27/04, 23/52*

U.S. Cl. 357—71 **13 Claims**



1. A programmable semiconductor device comprising a supporting member having a semiconductor circuit element and an electric conductor which belongs to a first line and which can be connected electrically conductively to the semiconductor circuit element, characterized in that the device comprises:

a strip of electrically conductive material which is connected electrically conductively at least at one end of the conductor belonging to the first line, which strip is separated from the semiconductor circuit element or a contact layer connected thereto electrically conductively at least over a part of its length by gas or a vacuum, which part extends separately from the electric conductor above the semiconductor circuit element or the contact layer and is separated therefrom by an intermediate space proportioned such that as a result of electrostatic attraction between the strip and the semiconductor circuit element or the contact layer a connection can be formed between the

strip and the semiconductor circuit element or the contact layer;

wherein said strip of electrically conductive material consists of a material different from the material used for said electric conductor and for the semiconductor metallization; and

said strip of electrically conductive material is positioned below said electric conductor.

4,528,584

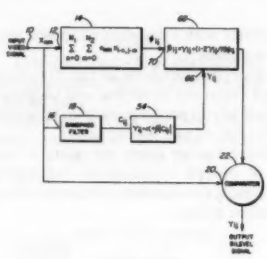
BILEVEL CODING OF COLOR VIDEO SIGNALS

Mohammed S. Sabri, Beaconsfield, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 3, 1982, Ser. No. 446,608

Int. Cl.³ H04N *9/32*

U.S. Cl. 358—12 **25 Claims**



1. Video signal processing apparatus comprising means for bilevel coding discrete picture elements of a colour video signal having a luminance component and a chrominance component, including:

means for deriving from a plurality of picture elements including at least one picture element other than the picture element to be encoded a first signal, (ϕ_{ij}), proportional to said luminance component;

means for deriving a second signal (C_{ij}) proportional to said chrominance component;

means for computing from said the first and second signals a threshold signal (B_{ij}) and

a comparator for comparing said picture element to be encoded with said threshold value and providing an output signal Y_{ij} having either one of two states in dependence upon whether or not said picture element exceeds said threshold value.

4,528,585

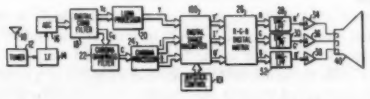
TELEVISION RECEIVER HAVING PICTURE MAGNIFYING APPARATUS

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 30, 1983, Ser. No. 480,595

Int. Cl.³ H04N *9/535, 5/14, 3/22, 5/22*

U.S. Cl. 358—22 **20 Claims**



15. In a television receiver including a source of analog video signals, an analog-to-digital converter for producing digital samples representative of said analog video signals, a digital signal processor for producing digital luminance and digital chrominance samples from said digital samples, and a converting means for developing image representative signals from said digital luminance and said digital chrominance samples to produce a raster-scanned image on a raster-scanned display device,

apparatus modifying said digital luminance and said digital chrominance samples for magnifying a predetermined area of said image by a factor 2^I, said predetermined image area including M image elements and N lines of said raster scan, wherein I, M and N are integers, comprising:

window generating means for locating said predetermined image area at selectable predetermined horizontal and vertical positions of said image and for locating said magnified image area in predetermined horizontal and vertical relationship to said predetermined image area;

a user-actuated device coupled to said window generating means for selecting said selectable predetermined horizontal and vertical positions;

a digital memory to which said digital luminance and said digital chrominance samples are applied, said digital memory having first addressable storage registers for storing a number M×N of said digital luminance samples corresponding to said predetermined image area, and having second addressable storage registers for storing a number no greater than (M×N)/2 of said digital chrominance samples corresponding to said predetermined image area;

addressing means responsive to said window generating means for developing first addressing signals to addresss said first and second addressable storage registers to store ones of said digital luminance and said digital chrominance samples at times when lines of said raster scan correspond to said predetermined image area, and for developing second addressing signals to address said first and second addressable storage registers to produce said stored ones of said digital luminance and said digital chrominance samples at times of said lines other than times of said lines corresponding to said magnified image area;

interpolating means to which said produced stored ones of said digital luminance and said digital chrominance samples are applied for developing 2^I×M image samples representing modified digital luminance and modified digital chrominance samples corresponding to lines of said raster scan within said magnified image area, said interpolating means developing said 2^I×M image samples for each line corresponding to the 2^I×N lines within said magnified image area; and

multiplexing means responsive to said window generating means for applying said modified digital luminance and said modified digital chrominance samples in place of the digital luminance and digital chrominance samples, respectively, corresponding to said magnified image area,

whereby the image produced on said display device includes a magnified portion thereof in accordance with said position selected by said user-actuated device.

4,528,586

AUTOMATIC TINT CORRECTION WITH REDUCED COLOR SATURATION ERROR

Henry G. Lewis, Jr., Hamilton Square, and Allen L. Limberg, Hopewell Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1983, Ser. No. 487,107

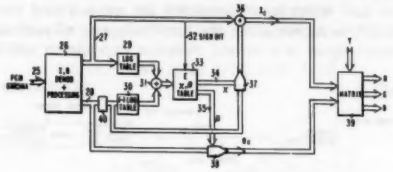
Int. Cl.³ H04N *9/535*

U.S. Cl. 358—28 **17 Claims**

1. In a TV receiver including a source of quadrature color mixture signals **A1** and **A2**, a matrix responsive to signals **A1** and **A2** for generating RGB signals, and apparatus for generating signals **A1'** and **A2'** responsive to signals **A1** and **A2** for automatically adjusting a prescribed color, said apparatus comprising:

means responsive to the **A1** and **A2** color mixture signals for generating control signals when the magnitude of **A1** exceeds the magnitude of **A2** by a predetermined amount;

means responsive to said control signals for selectively attenuating signal A2 to generate signal A2'; and



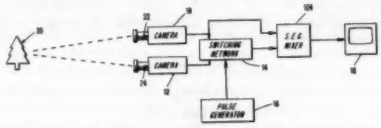
means responsive to said control signals for selectively augmenting signal A1 by linearly combining it with a predetermined portion of signal A2 to generate signal A1'.

4,528,587

THREE-DIMENSIONAL VIDEO APPARATUS AND METHODS USING COMPOSITE AND MIXED IMAGES

Edwin R. Jones, Jr., Columbia, S.C., assignor to CJM Associates, Chapin, S.C.

Filed Oct. 28, 1982, Ser. No. 437,473
Int. Cl.³ H04N *9/54*
U.S. Cl. 358—92 **18 Claims**



1. A method for producing a three-dimensional illusion of a subject comprising the step of sequentially displaying on a viewing surface images of the subject as formed alternately of a first series of a first type of picture frames and a second series of a second type of a picture frames at a rate within a range of 4 to 30 changes between said first and second series of picture frames per second, said first type of picture frames comprising at least two interlaced images of said subject as viewed from different points of origin and said second type of picture frames comprising at least two interlaced images of said subject as viewed from different points of origin, said images of said first type of picture frames being different in order of point of origin from said second type of picture frames.

4,528,588

METHOD AND APPARATUS FOR MARKING THE INFORMATION CONTENT OF AN INFORMATION CARRYING SIGNAL

Bo Löfberg, Vindragarvägen 12, S-117 40 Stockholm, Sweden

PCT No. PCT/SE81/00279, § 371 Date May 18, 1982, § 102(e) Date May 18, 1982, PCT Pub. No. WO82/01273, PCT Pub. Date Apr. 15, 1982
PCT Filed Sep. 25, 1981, Ser. No. 385,374
Claims priority, application Sweden, Sep. 26, 1980, 8006772; Dec. 23, 1980, 8009138
Int. Cl.³ H04N *7/16;* **G11B** *5/86, 15/04*
U.S. Cl. 358—122 **17 Claims**

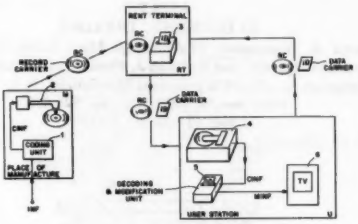
1. A method for processing a coded video information signal, which coded information signal is transmitted from a signal source to a signal receiver, in order to mark the information content of the information signal and thereby to permit tracing of unauthorized copying of said information signal, the method comprising:

decoding the video information signal at a signal receiver during reception;

obtaining an identification information and unique modification information from a data carrier, said identification information comprising personal identification information in the form of a personal code comprising a bit sequence of a given number of bits;

modifying the decoded information signal at said signal receiver by introducing said obtained identification information into the decoded information signal by a repeated bit-by-bit introduction of said personal identification bit sequence into said decoded information signal;

said identification information being a characteristic of at least one of said signal receiver and its possessor; and



said identification information being introduced into at least one of time and frequency spaces of the decoded information signal such that the information content of said information signal is essentially unchanged;

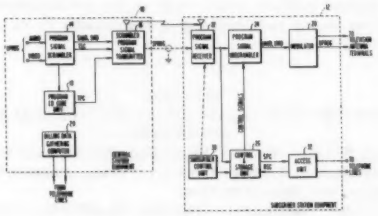
said modifying step comprising introducing at least one bit of said bit-by-bit personal identification bit sequence within one line interval of each field of said video signal, and wherein said interval is randomly selected for each field as a function of said modification information obtained from said data carrier.

4,528,589

METHOD AND SYSTEM FOR SUBSCRIPTION TELEVISION BILLING AND ACCESS

Robert S. Block, Marina Del Ray, Calif., and John R. Martin, Milwaukee, Wis., assignors to Telease, Inc., Los Angeles, Calif.

Continuation of Ser. No. 365,498, Apr. 5, 1982, abandoned, which is a continuation of Ser. No. 190,657, Sep. 25, 1980, abandoned, which is a division of Ser. No. 920,846, Jun. 30, 1978, Pat. No. 4,225,884, which is a continuation-in-part of Ser. No. 768,404, Feb. 14, 1977, Pat. No. 4,163,254. This application Feb. 1, 1984, Ser. No. 575,761
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—122 **9 Claims**



1. In a television system in which subscription program signals containing subscription program material are transmitted to subscribers, a program selection system comprising:

means at a location remote from the subscriber location for transmitting the subscription program signals with an associated signal indentifying the program signal as containing subscription program material in at least one of a plurality of subscriber accessible categories of subscription program material;

means at the subscriber location for receiving the subscription signals and the associated category identifying signal;

subscriber-actuated means at the subscriber location for selecting at least one category of subscription program material and producing a local category signal identifying said selected category of subscription program material;

means for comparing said local category signal and said received category identifying signal to produce a control signal for limiting selection of program material to said at least one category identified by said local category signal.

4,528,590

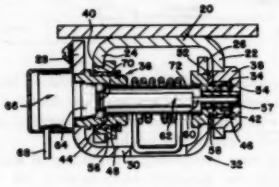
ELECTRONIC TREADLE

Lenora A. Bisacquino, Middleburgh Hts.; Larry E. Dienes, North Ridgeville, and Rudolph J. Plasko, Lorain, all of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Nov. 9, 1983, Ser. No. 549,855

Int. Cl.³ H01C *10/12*

U.S. Cl. 338—153 **20 Claims**



1. Electronic treadle for generating an electrical signal proportional to the degree of angular movement of a pivotally mounted treadle plate comprising a base, a treadle plate, means pivotally mounting said treadle plate on said base for pivotal movement about an axis of rotation, said base including connecting means for supporting said pivotally mounting means, a rotary potentiometer mounted on said base and having an axis of rotation coaxial with the axis of rotation of said treadle plate, said potentiometer having an input rotatable about said axes of rotation, said potentiometer being adapted to generate an output signal in response to rotation of said input about said axes, the magnitude of said output signal varying in response to the magnitude of the angular displacement of said input from a neutral position, a drive shaft having an axis, said drive shaft being rotatable about its own axis and coupling said input of the potentiometer with the connecting means for coupling the input of the potentiometer for rotation with the pivotally mounting means as the latter rotates with the treadle plate relative to the base from a neutral position corresponding to the neutral position of said input of the potentiometer, and resilient means yieldably urging said treadle to its neutral position.

4,528,591

RASTER SCAN FRAME DIGITIZER METHOD AND APPARATUS

Steven F. Liepe, Tualatin; Pierre Radochonski, Lake Oswego, and Glenn R. Johnson, Aloha, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 16, 1982, Ser. No. 408,349

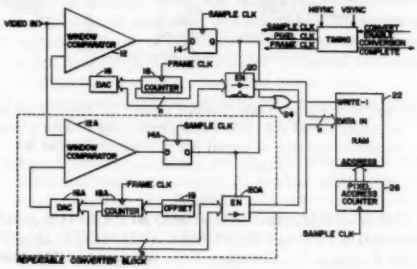
Int. Cl.³ H04N *5/14*

U.S. Cl. 358—160 **6 Claims**

1. An apparatus for digitizing a stationary video input signal and storing the digitized values in a memory, comprising:

first means responsive to said video input signal for creating a first window region disposed along the time axis of said video input signal and for moving said first window region along the amplitude axis of said video input signal in a first direction, said first means sampling the amplitude of the video signal within said first window region as said first window region is moved along the amplitude axis and storing the sampled amplitude in said memory; and

second means responsive to said video input signal for creating a second window region disposed along the time axis of said video input signal and for moving said second window region along the amplitude axis of said video input signal in a second direction opposite to said first



direction, the region encompassed by the moving second window not including the region encompassed by the moving first window, said second means sampling the amplitude of the video signal within said second window region as said second window region is moved along the amplitude axis and storing the sampled amplitude in said memory.

4,528,592

TV-IF CIRCUIT

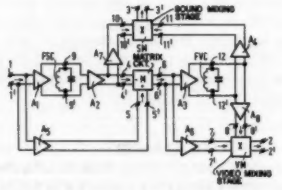
Hans J. Apeldoorn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,414

Claims priority, application Netherlands, Jan. 29, 1982, 8200328

Int. Cl.³ H04N *5/60, 5/62*

U.S. Cl. 358—198 **8 Claims**

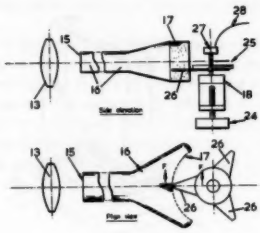


1. A TV-IF circuit comprising a balanced video signal path arranged between an IF-output and a video signal output and a balanced sound signal path arranged between the IF-input and a sound signal output, these paths including a video mixing stage and a sound mixing stage, respectively, characterized in that said TV-IF circuit further comprises a matrix circuit having a balanced, non-inverting and a balanced, inverting input, as well as balanced output, said matrix circuit being included via the non-inverting input and the output thereof in one of said two signal paths between the IF-input and a signal input of the mixing stage in said one signal path, the other signal path, between the IF-input and a signal input of the mixing stage in said other signal path, being connected to the balanced, inverting input of the matrix circuit and comprising, between the IF-input and the matrix circuit, a balanced first pair of terminals having connected therebetween a resonant circuit having resonant frequency which corresponds to a sound carrier frequency of the TV-IF signal applied to the IF-input.

4,528,593
VISUAL SENSOR SYSTEMS

James C. B. Nicol, 23 Craighead Rd., Bishopton, Renfrewshire, Scotland

Filed Oct. 22, 1982, Ser. No. 436,037
Claims priority, application United Kingdom, Oct. 23, 1984, 8132094
Int. Cl.³ H04N *3/02, 7/18, 1/04, 1/10*
U.S. Cl. 358—200 **6 Claims**



1. Production monitoring apparatus for use with a process in which a series of products intended to be identical are manufactured, said apparatus comprising a visual sensor system for viewing and providing computer-compatible scan-pattern data representative of products of said series sequentially presented to said visual sensor system, computer means connected to said visual sensor system to receive therefrom said computer-compatible scan pattern data, said computer means incorporating a memory pre-programmed with a predetermined scan pattern representative of a standard product and being associated with an output device arranged to indicate the disparities of sequentially-presented products in relation to said standard for adjusting the manufacturing process to reduce or eliminate said disparities, said visual sensor system comprising means for delivering image-forming radiation from a said product to a focal surface remote from said product the spatial shape of which focal surface is determined by said means, an ordered bundle of radiation guide members interconnecting a receptor surface and a delivery surface, said receptor surface being located at and physically conforming with the spatial shape of said focal surface, and an opto-mechanical radiation scan device located adjacent said delivery surface, said scan device comprising a radiation detector probe which is movable in a predetermined scan surface the spatial shape of which scan surface is determined by said scan device, said delivery surface being located at and physically conforming with the spatial shape of said scan surface, and wherein said probe provides said computer-compatible data by virtue of the presence at the delivery surface of discrete radiation guide member ends which provide discrete radiation packages to said probe.

4,528,594
HIGH RESOLUTION QUADRILINEAR CCD IMAGER

Narayan K. Kadekodi, Torrance; Shey-Ping L. Sheu, San Pedro, and Abd-El-Fattah A. Ibrahim, Palos Verdes Estates, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 20, 1983, Ser. No. 486,766
Int. Cl.³ H04N *5/30*
U.S. Cl. 358—213 **1 Claim**

1. A high resolution charge coupled device (CCD) imager deposited on a single integrated circuit chip comprising:

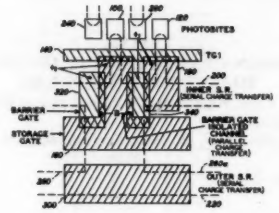
photosite means for detecting the amount of light impinged thereon,

transfer gate means adjacent said photosite means for transferring the electronic charges under said photosite means indicative of said amount of light impinged thereon,

inner shift register means for receiving said electronic charges from said photosite means,

outer shift register means for receiving every other one of said charges from said inner shift register means, said outer shift register means receiving said charges via isolated channel means which comprises at least two barrier gate means deposited on said inner shift register means and lying adjacent a path from said transfer gate means through said inner shift register means to said outer shift register means, the separation of said barrier gate means defining the channel width of movement for said electronic charges,

generally T-shaped storage gate means deposited on said imager between said barrier gate means and said integrated circuit chip to receive said electronic charges from



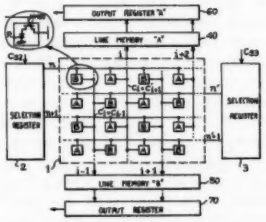
said transfer gate means, the generallly vertical part of said T-shape lying on and slightly wider than said channel width and the horizontal part of said T-shape lying horizontal or parallel to and generally between said inner and outer shift register means, and

field oxide layer means as the first layer between the integrated circuit chip and said storage gate means defining the inner and outer shift register means with a separation at said channel wider than the channel defined by said barrier gate means but not as wide as the horizontal part of said T-shaped portion of said storage gate.

4,528,595
LINE TRANSFER IMAGER AND TELEVISION CAMERA INCLUDING SUCH AN IMAGER

Jean-Yves Eouzan, Thorigne, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 13, 1983, Ser. No. 531,727
Claims priority, application France, Sep. 14, 1982, 82 15505
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **4 Claims**



1. Line transfer imager including a matrix of m lines of p photosites and comprising, for controlling the reading of stored charges corresponding to an image, two selection shift registers having outputs connected to the photosites selection inputs of the odd and even lines of the matrix respectively, (P/2) conducting columns connecting the photosites of even positions of the odd lines and the photosites of odd positions of the even lines of the matrix to a first line memory of (P/2) stages with parallel outputs, (P/2) conducting columns connecting the photosites of odd positions of the odd lines and the photosites of even positions of the even lines of the matrix to a

second line memory of (P/2) stages with parallel outputs, the (P/2) parallel outputs of each of the line memories being connected to every k stage of two charge transfer output registers having (kp/2) stages, k being equal to 2 or 3, the imager having two possible readout modes, the first being a line by line reading of a frame formed by the odd lines of the matrix of photosites, then a frame formed by the even lines, the second, called pseudo-interlaced, being the reading of two successive lines of the matrix during each line suppression period, the output of data contained in the two output registers being able to be, in this readout mode, simultaneous, one line of one image frame being formed by the combination of the data from two successive lines of the matrix.

4,528,596

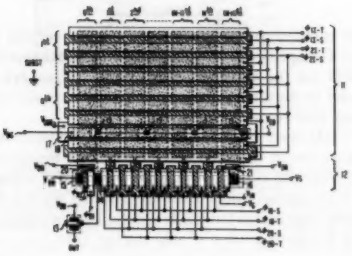
SUPPRESSION OF EDGE EFFECTS ARISING IN CCD IMAGER FIELD REGISTERS

Appleton D. Cope, Hightstown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1982, Ser. No. 445,549

Int. Cl.³ H04N *5/30*

U.S. Cl. 358—213 **5 Claims**



1. A CCD imager comprising:

a CCD output register for performing parallel-to-series conversion, said CCD output register including a succession M in number of charge-shifting stages recurrently clocked to move charge from one stage to the next, into which charge shifting stages charge packets parallelly supplied said output register are admitted, the admission being during recurrent halts in the clocking of charge packets from each charge-shifting stage in said succession to the next, and said CCD output register further including an output stage from which is supplied response to charge packets moved from the last charge-shifting stage;

a CCD imager register including at least M+2 charge transfer channels arranged side-by-side in parallel array, each charge transfer channel containing a respective succession n in number of charge-shifting stages, its charge transfer channels being recurrently clocked in unison to generate a succession of parallelly supplied charge packets, which CCD image register is of the type in which charge packets are generated in portions of its charge-shifting stages during recurrent halts in said clocking in unison, this being done by photoconversion of an optical-frequency radiant-energy image projected into each of the M+2 charge transfer channels in said parallel array;

means for applying charge packets from respective outputs of the M charge transfer channels of said CCD image register that are in the middle of said M+2 charge transfer channels side-by-side in parallel array, as the charge packets parallelly supplied to respective ones of the charge-shifting stages of said CCD output register; and

means for otherwise disposing of the charge packets from the respective outputs of the other charge transfer channels in said CCD image register.

4,528,597

TELEVISION SET

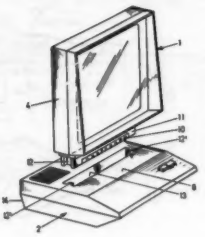
Walter Klein, Erlangen-Tennenlohe, and Hans Mangold, Fuerth, both of Fed. Rep. of Germany, assignors to Grundig E.M.V., Fuerth, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,229

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3143932

Int. Cl.³ H04N *5/64*

U.S. Cl. 358—254 **15 Claims**



1. A television set comprising:

a video screen portion which is self-contained in a first housing;

a receiver portion which is self-contained in a second housing, said receiver portion capable of receiving and conveying audio and video signals;

detachable connecting means coupled between said video screen and receiver portion so as to permit video or electrical signals to pass from the receiver portion to the video screen portion;

said connecting means comprises a plug means and corresponding outlet means capable of receiving said plug means and providing a connection therebetween for passing signals;

said plug means forms a part of said video screen portion and said outlet means includes at least two separate outlets positioned at different locations on the receiver portion, each outlet capable of receiving said plug means and providing a connection therebetween for passing signals; and wherein the decoupling of the plug means from the outlet means from one of said portions allows for the separation of the respective housings.

4,528,598

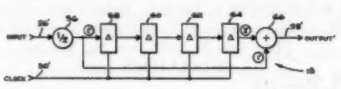
CHROMINANCE INVERTING ALL-PASS FILTER

David E. Trytko, Foster City, and Steven D. Wagner, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1983, Ser. No. 483,328

Int. Cl.³ H04N *5/94, 9/491*

U.S. Cl. 358—314 **25 Claims**



1. A filter for receiving a composite color video signal including luminance and chrominance components and inverting the chrominance component relative to the luminance component without separating the chrominance and luminance components, said filter defining a signal path for the composite color video signal extending between an input for receiving the composite color video signal and an output, and defining a selected effective delay for the composite color video signal between the input and output, comprising:

delay means coupled to the input of the signal path for receiving and delaying the composite color video signal;

summing means having an input for receiving and summing signals and providing a summed output at the output of the signal path;

signal weighting means with a selected weighting factor coupled to the signal path between the input thereof and the input to the summing means for receiving the composite color video signal and providing a respective weighted value representation of the received composite color video signal at an output of the signal weighting means; and

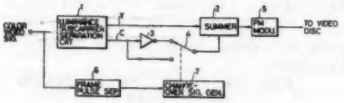
the output of the signal weighting means coupled to at least two different locations along the signal path, with the selected weighting factor of the weighting means and the location along the signal path selected to effect at the output of the signal path an inversion of the chrominance component without objectionably changing the phase and amplitude of the luminance component relative to the inverted chrominance components.

4,528,599

FM ANGULAR MODULATION SYSTEM FOR VIDEO SIGNAL RECORDING

Takashi Okano, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,686
Claims priority, application Japan, Jul. 23, 1980, 55-100954
Int. Cl.³ H04N *9/491*
U.S. Cl. 358—328 **4 Claims**



1. An apparatus for recording and reproducing a color video signal according to an angular modulation system, comprising:

a delay circuit having an output coupled to receive a color video signal for recording, said color video signal having a plurality of different frames, said delay circuit producing a delay substantially equal to one-half of a period of a subcarrier of said color video signal;

a switch having a first input contact coupled to receive said color video signal and a second input contact coupled to an output of said delay circuit;

a frame pulse separating circuit operating in response to said color video signal for producing frame pulses between frames of said color video signal;

changeover signal generating switch means for operating said switch to alternately couple said output of said switch to said first and second input contacts in response to said frame pulse;

an FM modulator having an input coupled to an output of said switch;

recording means for recording an output of said FM modulator on a recording medium; and

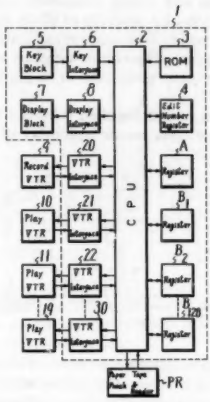
reproducing means for reproducing video signals from said recording medium, said reproducing means including means for alternately delaying said color video signal during every other frame so that subcarrier signals of successive reproduced frames are out-of-phase with respect to one another.

4,528,600

EDITING CONTROL SYSTEM

Mamoru Ishiguro, and Mitsutaka Enomoto, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,225
Claims priority, application Japan, Oct. 20, 1981, 56-167667
Int. Cl.³ H04N *5/782;* **G11B** *27/02*
U.S. Cl. 360—14.1 **7 Claims**



1. An editing control system, comprising:

a record VTR connected to record a video signal reproduced from one of a plurality of play VTRs, each of said play VTRs using a video tape cassette and having switch means for detecting insertion and ejection of a tape cassette,

editing control means for controlling said record and play VTRs, said editing control means having a plurality of register means for respectively registering editing data including at least a reel number corresponding to the cassette used for editing, and flag data representing insertion and ejection of said tape cassette,

means for detecting an entry of said editing data,

means for manually incrementing said reel number,

means for detecting an absence of manual incrementing of said reel number,

means for automatically incrementing said reel number in response to said flag data and a signal from said means for detecting an entry of the editing data, and

means for changing said flag data after incrementing of said reel number.

4,528,601

DIGITAL SIGNAL REPRODUCING APPARATUS

Masaru Moriyama, Yamato, and Kohei Sasamura, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Dec. 15, 1983, Ser. No. 561,749
Claims priority, application Japan, Dec. 24, 1982, 57-230320
Int. Cl.³ G11B *5/02, 5/09, 5/45*
U.S. Cl. 360—46 **6 Claims**

1. A digital signal reproducing apparatus for reproducing a recorded unipolar signal from a recording medium and for detecting the signal level of the reproduced unipolar signal so as to reproduce a desired unipolar digital signal, said recorded unipolar signal being obtained by passing said desired unipolar digital signal through a converter and delay means, feeding back a delayed output signal of said delay means to said converter, and carrying out a modulo-2 addition in said converter, said digital signal reproducing apparatus comprising:

reproducing means for reproducing said recorded unipolar signal from said recording medium;

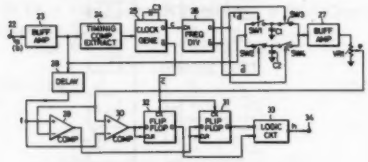
an equalizer for subjecting the reproduced signal from said reproducing means to a waveform equalization;

a timing component extracting circuit for extracting a timing component which has a period equal to one bit transmission period of said recorded unipolar signal, from an output signal of said equalizer;

a clock signal generating circuit supplied with said timing component from said timing component extracting circuit, for generating one or a plurality of clock signals which are in phase synchronism with said timing component;

a control signal generating circuit supplied with said timing component, for generating one or a plurality of control signals;

a sample and hold circuit supplied with the output signal of said equalizer and said one or a plurality of control signals,



for sampling and holding a peak value of the output signal of said equalizer for every one bit transmission period according to said one or a plurality of control signals;

a variable resistor for voltage-dividing an output signal of said sample and hold circuit, and for producing a reference signal;

a delay circuit for delaying the output signal of said equalizer so as to match the timing of the output signal of said equalizer with the timing of said reference signal;

a comparing circuit for comparing the level of an output signal of said delay circuit with the level of said reference signal, and for producing a unipolar pulse signal; and

a reproduced digital signal producing circuit for controlling the pulse width and the pulse position of the output unipolar pulse signal of said comparing circuit by said one or a plurality of clock signals, and for producing a reproduced unipolar digital signal.

4,528,602

ELECTRICAL CALIBRATION ARRANGEMENTS

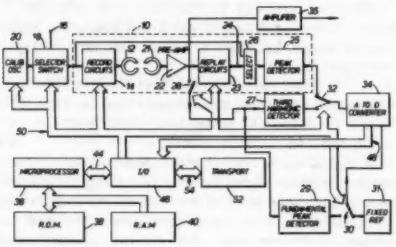
Neil Crick, Romsey, and Anthony Miles, Fawley, both of England, assignors to Racal Recorders Limited, Bracknell, England

Filed Feb. 23, 1983, Ser. No. 468,961

Claims priority, application United Kingdom, Feb. 25, 1982, 8205625

Int. Cl.³ G11B *5/47, 5/02*

U.S. Cl. 360—66 **18 Claims**



1. An automatic calibration system for calibrating parameter-adjusting circuits in magnetic recording and reproducing apparatus having magnetic recording means and reproducing means, recording circuitry including said parameter-adjusting circuits connected to said magnetic recording means, and reproducing circuitry including said parameter-adjusting circuits connected to said magnetic reproducing means, comprising

means generating a first calibrating signal for calibrating a predetermined parameter adjusted by one said parameter-adjusting circuit of the recording circuitry,

means automatically recording the calibrating signal onto a magnetic storage medium via the said one parameter-adjusting circuit of the recording circuitry and the magnetic recording means of the apparatus,

first adjusting means connected to the magnetic reproducing means for automatically monitoring the value of the reproduced recorded signal independently of any parameter-adjusting circuits and operative in dependence on the value of the monitored signal to automatically adjust the said predetermined parameter adjusted by the said one parameter-adjusting circuit of the recording circuitry,

means generating a second calibrating signal for calibrating a predetermined parameter adjusted by one said parameter-adjusting circuit of the reproducing circuitry,

means automatically recording the second calibrating signal onto a magnetic storage medium via the said one parameter-adjusting circuit of the recording circuitry after that parameter-adjusting circuit has been adjusted by the first adjusting means, and

second adjusting means for monitoring the recorded second calibrating signal as it is reproduced from the magnetic storage medium by the magnetic reproducing means and the parameter-adjusting circuits of the reproducing circuitry and operative in dependence on the value of the reproduced second calibrating signal to calibrate the said one parameter-adjusting circuit of the reproducing circuitry of the apparatus.

4,528,603

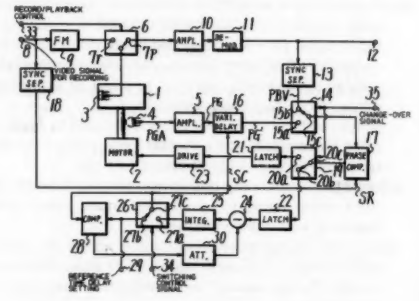
DRUM SERVO CONTROL WITH REDUCED HEAD PHASE ERROR DURING EDITING

Fumiyoshi Abe, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,190

Int. Cl.³ G11B *21/04*

U.S. Cl. 360—70 **17 Claims**



1. A head drum servo control arrangement in video tape recording and reproducing apparatus in which video signals are recorded in successive parallel tracks traversing a record tape with the video signals containing a regularly occurring synchronization signal therein, the apparatus including video input means to which an input video signal is applied, a transducer head to which the input video signal is applied for recording and from which a reproduced video signal is derived during playback, output video processing circuitry for process-

ing the video signal reproduced from said tape, a rotatable head drum on which said transducer head is mounted so that the latter scans said successive parallel tracks when said tape is advanced past said head drum, rotational phase detecting means providing a drum phase signal to indicate rotational phase of said head drum, controllable drive means for rotationally driving said head drum and having an input for receiving a drive control signal which is varied to control the rotational phase of said head drum, off-tape synchronization signal separating means coupled to said video input means for producing a reference synchronization signal, and reproduced synchronization signal separating means coupled to said output video processing circuitry for producing a reproduced synchronization signal from the video signal reproduced from the tape; the head drum servo control arrangement comprising:

variable delay means having a signal input coupled to receive said drum phase signal, a control input coupled to receive a phase control signal, and an output providing a delayed drum signal delayed an amount determined by said phase control signal;

first phase comparator circuit means provided with said reference synchronization signal and said delayed drum phase signal, and selectively providing during a first time period said drive control signal in response to a comparison of phases of such signals;

second phase comparator circuit means provided with said reference synchronization signal and said reproduced synchronization signal and selectively providing during a second time period a phase error signal in response to a comparison of phases of such signals;

switch means connected to said first and second phase comparator circuits for alternately selecting one of said first and second phase comparator circuits to provide said drive control signal and said phase error signal during said first and second time periods, respectively, in response to a change-over signal alternating at a field rate of the video signal;

phase control signal setting means receiving said phase error signal for generating therefrom said phase control signal fed to said variable delay means wherein said delayed drum phase signal is provided in response thereto; and

offset means connected to receive said phase error signal from said phase control signal setting means and receiving a time delay reference signal for reducing said phase error signal before application thereof to said phase control signal setting means by an offset amount corresponding to a predetermined fraction of the difference between said phase control signal and said time delay reference signal.

4,528,604

TAPE END DETECTING DEVICE IN A RECORDING AND/OR REPRODUCING APPARATUS FOR A MINIATURE TYPE TAPE CASSETTE

Tsuneyuki Koyama, Yokohama, Japan, assignor to Victor Company of Japan Ltd., Japan

Filed Jun. 14, 1983, Ser. No. 504,171

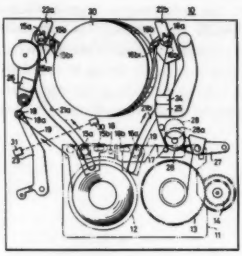
Claims priority, application Japan, Jun. 15, 1982, 57-102901

Int. Cl.³ G11B *15/22*

U.S. Cl. 360—74.2 **7 Claims**

1. A tape end detecting device in a recording and/or reproducing apparatus, said recording and/or reproducing apparatus being loaded with a miniature type tape cassette comprising a supply reel and a take-up reel which have a tape wound thereon, said tape having the ends thereof fixed to said supply reel and said take-up reel, said recording and/or reproducing apparatus comprising a tape loading mechanism for drawing out said tape out of said miniature type tape cassette and loading said tape into a predetermined tape path during a recording or reproduction mode thereof, said tape loading mechanism being inoperative during a tape rewinding or tape fast-forwarding mode of said recording and/or reproducing apparatus so that rewinding or fast-forwarding of said tape is carried out by rotating said supply reel or said take-up reel within said miniature type tape cassette in a state where said tape is accommodated within said miniature type tape cassette, said tape end detecting device comprising: rotation detecting means for detecting rotation of said supply

reel and said take-up reel of said miniature type tape cassette, and producing rotation detection signals in accordance with the rotation of said supply reel and said take-up reel, said supply reel and said take-up reel stopping rotation when all of the tape is fed out from one reel to the other



reel and an end of the tape is reached, said rotation detecting means producing no rotation detection signal when said reels stop rotating; and

control means for carrying out counting with a predetermined time interval according to the rotation detection signals from said rotation detecting means during the tape rewinding or tape fast-forwarding mode, and stopping the tape rewinding or tape fast-forwarding mode when a count within said predetermined time interval is zero.

4,528,605

ROTARY MAGNETIC HEAD SCANNING CONTROL SYSTEM IN A MAGNETIC RECORDING AND REPRODUCING APPARATUS

Seisuke Hiraguri, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 10, 1983, Ser. No. 465,466

Claims priority, application Japan, Feb. 13, 1982, 57-21849; Feb. 13, 1982, 57-21850

Int. Cl.³ G11B *5/58*

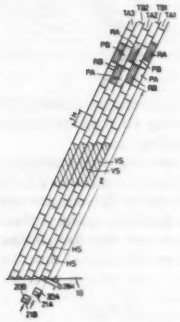
U.S. Cl. 360—77 **6 Claims**

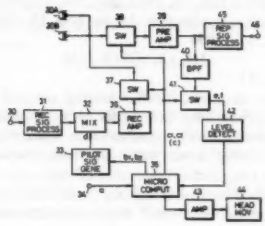
1. A rotary magnetic head scanning control system in a magnetic tape recording and reproducing apparatus comprising a plurality of rotary magnetic heads which record signals during a recording mode while forming tracks which are oblique to the longitudinal direction of said magnetic tape and which reproduce recorded signals from said tracks during a reproducing mode, and head height position control means operated responsive to a control signal for controlling the height positions of each of said rotary magnetic heads, said system comprising:

pilot signal generating means for generating a single pilot signal having a single frequency during said recording mode;

means for controlling an interruption and an application of the single pilot signal and of an information signal including at least a video signal to each of said rotary magnetic heads, the single pilot signal being supplied to one of said rotary magnetic heads together with said information signal during a first predetermined time period to cause said one rotary magnetic head to record the single pilot signal and the information signal on the same track, and the application of the information signal to said one rotary magnetic head being thereafter interrupted during a first specific time period to put said one rotary magnetic head into a reproducing state, and the application of the information signal to the other of said rotary magnetic heads being interrupted during a second specific time period in

which said other rotary magnetic head scans over a part of a track which is adjacent to a part of the track which is formed by said one rotary magnetic head and on which the single pilot signal is recorded in order to put said other rotary magnetic head in a reproducing state, and the single pilot signal thereafter being supplied to said other rotary magnetic head together with said information signal during a second predetermined time period to cause said other rotary magnetic head to record the single pilot signal and the information signal, each of said rotary magnetic heads reproducing as crosstalk a pilot signal which is recorded on a part of a track which is adjacent to a track which is actually being scanned by a rotary magnetic head, said one rotary magnetic head and said other rotary magnetic head recording said single pilot signal





during the respective first and second predetermined periods, each of said predetermined periods corresponding to a few horizontal scanning periods of the video signal, and said one rotary magnetic head and said other rotary magnetic head assuming a reproducing state for the respective first and second specific periods, each of said specific periods existing within a vertical blanking period which is separated in the longitudinal direction of the track by at least two or more horizontal scanning periods from a part of the track where a vertical synchronizing signal of the video signal is recorded; and

means responsive to a reproduction of said crosstalk for forming said control signal from the single pilot signal, means for applying said control signal to said head height position control means to bring each of said rotary magnetic heads to the same height position.

4,528,606

DRIVING DEVICE FOR TAPE RECORDER

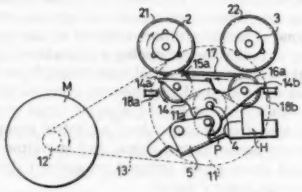
Tatsuhiko Tsuchiya, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,019

Claims priority, application Japan, Dec. 7, 1981, 56-182045[U]

Int. Cl.³ G11B *5/008, 15/32, 15/00;* **G03B** *1/04*

U.S. Cl. 360—96.3 **3 Claims**



1. A driving device for a tape recorder wherein a capstan shaft and a pair of reel shafts for taking up and rewinding a tape are driven and rotated by a motor, comprising a flywheel which is fixed to the capstan shaft and which rotates unitarily with said capstan shaft, means for transmitting power from the motor to said capstan shaft through said flywheel, a rocking bracket which is turnably mounted on an outer periphery of said capstan shaft, two transmission rollers which are disposed on said rocking bracket in a manner to be rotatable on their respective axes, a belt which is extended over said two transmission rollers, a pulley which is fixed to said capstan shaft and on which an outside surface of said belt is laid, the pair of reel shafts being disposed in a position where either of said two transmission rollers impinges on the corresponding reel shaft when said rocking bracket has turned, and means provided on said transmission rollers and for transmitting power to said reel shafts.

4,528,607

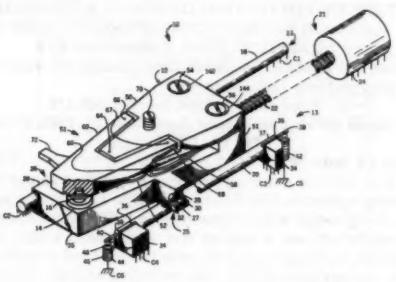
MAGNETIC RECORD/PLAYBACK HEAD POSITIONING APPARATUS

Herbert E. Thompson, Los Gatos, Calif., assignor to Drivetec, Inc., Milpitas, Calif.

Filed Sep. 30, 1982, Ser. No. 428,936

Int. Cl.³ G11B *21/18, 21/24, 5/54;* **F16H** *1/18*

U.S. Cl. 360—106 **21 Claims**



1. Head positioning apparatus for use in positioning one or more magnetic read/write heads relative to a storage medium, comprising:

carriage means:

drive means for moving said carriage means;

means forming an elongated primary guide way disposed in a fixed position on one side of said carriage means;

means forming an elongated secondary guide way disposed on the opposite side of said carriage means and oriented parallel to said primary guide way, said secondary guide way having at least its end portions partially cylindrical in configuration;

first and second bearing means attached to said one side of said carriage means in spaced apart relationship for following said primary guide way during movement of said carriage means;

third bearing means attached to said opposite side of said carriage means for following said secondary guide way during movement of said carriage means, said third bearing means being positioned along said opposite side of said carriage means at a longitudinal location midway between said first and second bearing means;

first and second support means disposed respectively at opposite ends of said secondary guide way and each having first and second surfaces that intersect along a line parallel to the axis of said primary guide way, said first surface being oriented substantially parallel to the plane formed by the axes of said primary and secondary guide ways, said second surface being substantially perpendicular to said first surface, said cylindrically configured end portions of each end of said secondary guide way being disposed in supported engagement with said first surfaces of said first and second support means; and

biasing means for applying a biasing force to said secondary guide way tending to cause it to roll on said first and second support surfaces away from said second surfaces thereby tending to bias said carriage means toward said primary guide way.

4,528,608

ELECTRONIC CURRENT INTERRUPTER INCLUDED IN A DC DISTRIBUTION SYSTEM

Hans O. V. Andersson, Sollentuna; Kjell D. Rundkvist, Norsborg, and Per E. Samsioe, Sollentuna, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

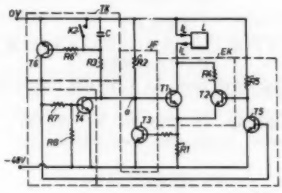
PCT No. PCT/SE83/00026, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO83/03035, PCT Pub. Date Sep. 1, 1983

PCT Filed Jan. 27, 1983, Ser. No. 552,043

Claims priority, application Sweden, Feb. 18, 1982, 8201003

Int. Cl.³ H02H *3/087*

U.S. Cl. 361—18 **2 Claims**



1. In a DC-distribution system having a supply source and a load and electronic current interruptor connected in series between the load and the supply source to operate when the load current through the interruptor exceeds a given value after a given time, comprising a current limiting power circuit comprising first transistor means for conducting the load current and second transistor means and current limiting means connected in parallel with the first transistor means, said first and second transistor means being unidirectional conducting in the same direction, means for controlling said first transistor means to switch from conductivity to non-conductivity when said load current exceeds a threshold value while said second transistor means remains conductive in order to limit the load current, a timing circuit being activated when the load current exceeds said threshold value for controlling second transistor means to become non-conductive after a predetermined time interval, and a holding circuit being activated when said second transistor means is rendered non-conductive and for maintaining said first transistor means non-conductive after said predetermined time interval has elapsed.

4,528,609

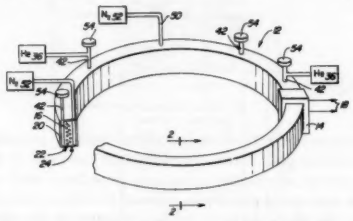
METHOD AND APPARATUS FOR PROTECTING SUPERCONDUCTING MAGNETIC ENERGY STORAGE SYSTEMS DURING RAPID ENERGY DISSIPATION

John R. Purcell, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Aug. 23, 1982, Ser. No. 410,499

Int. Cl.³ H02H *12/00*

U.S. Cl. 361—19 **9 Claims**



4. Apparatus for protecting a superconducting magnetic energy storage system having a coil storing energy in the magnetic field of said coil from damage caused by a change of state, occurring at a transition temperature of at least a portion of said coil from superconducting to normal conducting, and the consequent dissipation of said stored energy in said portion of said coil, comprising

a thermal capacitance in thermal contact with said coil, said thermal capacitance being formed of a substance that is frozen in situ at operating pressure at a temperature substantially above the transition temperature of said coil and that vaporizes below the temperature at which said system is damaged, the volume of said substance providing thermal capacity upon vaporization of said substance sufficient to dissipate substantially all of said stored energy without permitting said system to heat to said temperature at which said system is damaged,

liquid helium in thermal contact with said substance and said coil for normally cooling said coil and said thermal capacitance to a temperature which is low enough so that said coil is in its superconducting state, and

means for propagating any normal region that develops for more than a very short period of time in any portion of said coil over substantially all of said coil by removing said liquid helium from thermal contact with a substantial part of said coil,

whereby said substance absorbs heat generated in said normal region by said stored energy to maintain the temperature of said system at or below the temperature at which said system is damaged.

4,528,610

SHORT CIRCUIT FAULT ISOLATION MEANS FOR ELECTRICAL CIRCUIT ARRANGEMENTS

Roger D. Payne, Horndean, England, assignor to Apollo Fire Detectors Limited, Hampshire, England

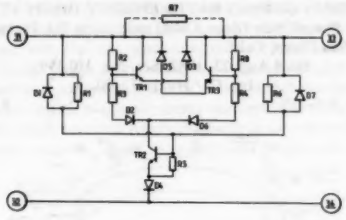
Filed Jul. 5, 1983, Ser. No. 510,931

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—62 **10 Claims**

1. Circuitry for isolating a section of a loop circuit from a bi-directional supply unit in the event of a short circuit in said section, said circuitry comprising one or more circuit elements connected between bi-directional isolating means in each section of the loop circuit, each of said isolating means comprising first and second terminal means coupled respectively to sequential sections of the loop circuit, transistor switching means providing a low impedance path and a high impedance path,

said low impedance path supplying current to said circuit elements from said supply unit and said high impedance path isolating said circuit elements from said supply unit; and sensing means for sensing a short circuit in either one of the sequential sections coupled to said first and second terminal means; said transistor switching means being biased by said sensing



means to cause said transistor switching means to provide said low impedance path in the absence of said short circuit and to cause a change in state from said low impedance path to the said high impedance path in the event of said short circuit so as to isolate the elements in the section coupled to the other of said first and second terminals from said short circuit.

4,528,611

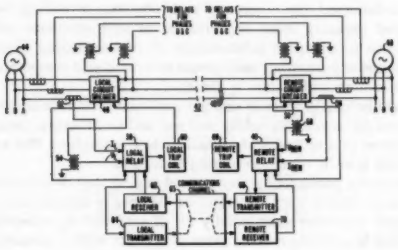
RELAY FOR PILOT PROTECTION OF ELECTRICAL POWER LINES

Eric A. Udren, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 22, 1983, Ser. No. 468,742

Int. Cl.³ H02H *3/18*

U.S. Cl. 361—81 **21 Claims**



1. A directional-comparison blocking protective relay located at a local end of a protected line segment of an ac electrical power network for opening a circuit interrupter means at the local end when a fault is detected on the protected line segment, wherein the fault is located by said directional-comparison blocking protective relay operating in communication with a remote protective relay located at a remote end of the protected line segment via a communications channel linking said directional-comparison blocking protective relay and the remote protective relay, and wherein the remote protective relay includes a remote receiver and a remote transmitter, and wherein the remote transmitter transmits a remote blocking signal to said directional-comparison blocking protective relay when a fault is detected in a reverse direction from the remote end, said directional-comparison blocking protective relay comprising:

current transformer means for producing a current signal representative of the current at the local end of the protected line segment;

voltage transformer means for producing a voltage signal representative of the voltage at the local end of the protected line segment;

fault detector means responsive to said current and said voltage signals for detecting the occurrence of a fault and for producing a fault signal in response thereto;

local transmitter means for producing a local blocking signal in response to said fault signal, wherein said local blocking signal is propagated over the communications channel to the remote receiver, and wherein said local blocking signal blocks the remote protective relay from tripping;

fault locator means responsive to said current and said voltage signals for producing a first signal if the fault is in the forward direction from the local end, and for producing a second signal if the fault is in the reverse direction from the local end, said fault locator means including means for producing a third signal if said fault locator means cannot determine the location of the fault after a predetermined time has elapsed, and for producing a fourth signal when said predetermined time has not elapsed and said fault locator means is still attempting to determine the fault location;

means responsive to said first signal for deactivating said local transmitter means such that said local transmitter means stops producing said local blocking signal thereby permitting said remote relay to trip if the remote relay determines that the fault is in the forward direction from the remote end;

means responsive to said third signal for deactivating said local transmitter means such that said local transmitter means stops producing said local blocking signal, and means responsive to said fourth signal for determining if the circuit interrupter means is open and for deactivating said local transmitter means if the circuit interrupter means is open, such that said local transmitter means stops producing said local blocking signal;

local receiver means responsive to the remote blocking signal for producing a received signal;

means responsive to said first signal and said received signal for producing a trip signal when said first signal is present and said received signal is not present;

wherein said trip signal opens the circuit interrupter means;

and wherein said local transmitter means produces said local blocking signal in response to said second signal for the duration of the fault.

4,528,612

APPARATUS FOR CONDITIONING A SPACE BY GAS IONIZATION

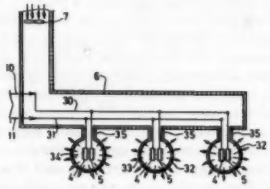
Walter Spengler, Strehlgasse 23, CH-4105 Biel-Benken, Switzerland

Filed Apr. 21, 1983, Ser. No. 487,198

Claims priority, application Switzerland, Apr. 21, 1982, 2409/82

Int. Cl.³ H05F *3/06*

U.S. Cl. 361—213 **9 Claims**



1. Apparatus for conditioning a space by ionizing a gas and introducing the ions produced into said space, said apparatus comprising:

a plenum chamber containing said gas;

a plurality of outlet ports communicating with said plenum

chamber, each of said outlet ports being adapted to be disposed adjacent a space to be conditioned;

a corresponding plurality of distribution cells, each distribution cell communicating with a corresponding one of said outlet ports and being adapted to be disposed within said space,

each distribution cell containing ionization means for ionizing said gas,

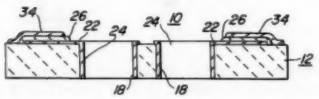
each distribution cell having a wall perforated by a plurality of discharge passages through which gas ionized by said ionization means may escape into said space in a corresponding plurality of streams oriented like those of a rose of a watering-can.

4,528,613

CERAMIC GLASS MATERIAL, CAPACITOR MADE THEREFROM AND METHOD OF MAKING THE SAME

Harold W. Stetson, Newtown, and Nellie L. Cabato, Plymouth Meeting, both of Pa., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 24, 1984, Ser. No. 583,153
Int. Cl.³ H01G *4/12*; H01B *1/06*
U.S. Cl. 361—321 **64 Claims**



62. An electrical capacitor component having an insulating layer bonded to a non precious metal conductor characterized by a high dielectric constant and insulation resistance, and a low dissipation factor made by

forming a conductive layer of non precious metal on the surface of a substrate,

applying to the substrate at least partially over the conductive layer a mixture in selected amounts of fine particles of barium titanate, leaded glass frit and an additive material containing manganese,

applying to a surface of the mixture opposite to its surface contacting the conductive layer a conductive coating including a non precious metal having a melting point higher than the firing temperature,

firing the coated substrate in a non oxidizing atmosphere to a selected temperature between approximately 900° C. and 1025° C. at which the glass softens, and

cooling the substrate to form a ceramic body of high dielectric constant and low dissipation factor between opposite conductive layers to form an electrical capacitor component on the substrate.

4,528,614

ELECTRIC CONTROL CENTER HAVING INTEGRAL AIR-VENTILATION SYSTEM

Sadiq A. Shariff, Palos Park; Brij M. Bharteey, DuPage, and Shahab A. Mehkri, Rich, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1983, Ser. No. 540,068
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—379 **3 Claims**

1. Metal clad switchgear, comprising:

a generally elongated vertical housing;

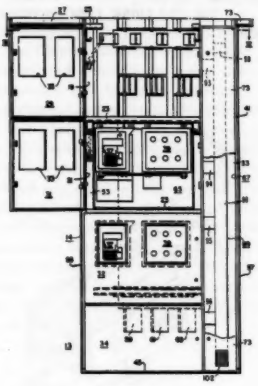
horizontal barrier means dividing the generally vertical housing into a plurality of tandem compartments that are arranged in stacked relationship with one another;

upstanding partition means within said housing adjacent a wall thereof and defining a vertically-extending compartment that is separated from the tandem compartments by said partition means and traverses substantially the entire length of the housing;

stationary bus bars mounted in the housing and extending along substantially the full vertical length thereof;

an electrical circuit interrupter apparatus mounted in each of the respective tandem stacked compartments and individually electrically connected to the stationary bus bars; and

a generally vertically-extending ventilation duct assembly disposed in the vertically-extending compartment within



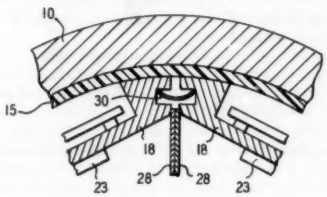
said housing and having at least one air intake opening located at the bottom of the housing, one air exhaust opening located at the top of the housing, and a plurality of transverse branch ducts that communicate with the plurality of tandem compartments and is thereby adapted to effect heat transfer from the housing and air-cool the enclosed interrupter apparatus and bus bars.

4,528,615

REPEATER HOUSING AND CIRCUIT MOUNTING STRUCTURE

Michael W. Perry, Ocean, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1983, Ser. No. 495,065
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **4 Claims**



1. A repeater housing and electronic circuits mounting structure comprising

a vessel having an electrical insulator in intimate contact with and covering an inside surface of the vessel;

a heat conducting structure including plural segments, each segment being configured for mounting electronic circuits and having surface areas contoured to match an inside surface of the electrical insulator;

electronic circuits affixed to the segments for dissipating heat during operation; and

leaf spring means positioned between the segments for pushing the segments apart and pressing the contoured surface areas of the segments into intimate contact with the inside surface of the electrical insulator to provide a high ther-

mal conductivity path from the electronic circuits through the segments to the electronic insulator.

4,528,616

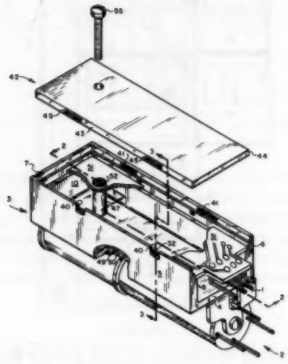
PRINTED WIRING BOARD ENCLOSURE

James V. Koppensteiner, Chicago, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Mar. 28, 1983, Ser. No. 479,309

Int. Cl.³ H05K *1/14*

U.S. Cl. 361—399 **3 Claims**



1. An enclosure adapted to contain an associated printed wiring board; said enclosure adapted for attachment to an associated relay; said enclosure comprising:

a U-shaped member including at least a base and first and second opposite sides, each of said sides including at least an inner wall facing the inner wall of the opposite side;

a cover adapted to engage said U-shaped member;

a board receiving ledge formed in each of said inner walls, each of said board receiving ledges including a board receiving ledge wall parallel to said respective side and a board receiving ledge floor perpendicular to said respective side, said floors lying in a common plane, and said ledges adapted to receive said printed wiring board;

at least one projection formed in each of said board receiving ledge walls, said projections deflected to permit said printed wiring board to pass and said projections restored following passage of said printed wiring board to retain said printed wiring board;

an aperture formed in said printed wiring board;

a first projection attached to said base; extending therefrom in a direction toward said cover and through said printed wiring board aperture;

a second projection attached to said cover, extending therefrom in a direction toward said base and abutting said first projection; a fastener extending through said cover, said printed wiring board aperture, and said U-shaped member and engaging said relay to attach said enclosure to said relay while preventing the application of tightening stresses to said printed wiring board.

4,528,617

LIGHT DISTRIBUTION APPARATUS

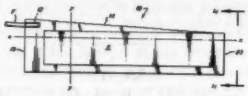
Paul A. Blackington, Vandling, Pa., assignor to Sheltered Workshop for the Disabled, Inc., Binghamton, N.Y.

Continuation of Ser. No. 346,723, Feb. 8, 1982, abandoned. This application Feb. 2, 1984, Ser. No. 576,313

Int. Cl.³ F21V *7/04*

U.S. Cl. 362—32 **15 Claims**

1. A light distributor for distributing light received from a source of small area over an output surface of greater area, comprising a transparent member having a first plurality of mutually-parallel surfaces spaced apart from each other in a first direction, spaced adjacent each other in a second direction perpendicular to said first direction, and extending obliquely to said first direction and in a third direction perpendicular to said first and second directions, so that said surfaces of said first plurality may intercept respective slices of a beam of light applied from said source to said member in said first direction and internally reflect said slices of said beam generally in said



second direction, a second plurality of mutually-parallel surfaces spaced apart in said second direction, spaced adjacent each other in said third direction, and extending obliquely to said second direction and in said first direction, so that said surfaces of said second plurality may intercept respective portions of said slices of said beam and internally reflect said portions generally in said third direction substantially perpendicularly onto said output surface, said output surface extending in said first and second directions.

4,528,618

PICTURE-SCREEN WORK-STATION LAMP

Hans-Ulrich Bitsch, Schanzenstrasse 1, 4000 Düsseldorf 11, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,511

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222003

Int. Cl.³ A61G *13/00*

U.S. Cl. 362—33 **11 Claims**

1. A lamp for a picture-screen work station comprising

a base including means for securing said base to a support,

a holder of bar shape swingably articulated to said base,

two non-coaxially lamp bodies each independently movably articulated to said holder,

a light bulb having a predetermined width being mounted in an interior of each of said lamp bodies,

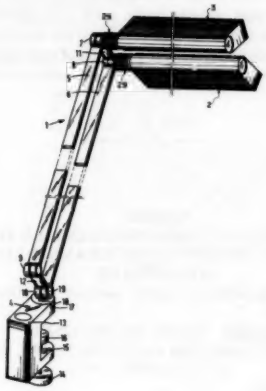
said holder includes joint means for moving said holder,

each of said two lamp bodies are of substantially identical elongated shape, each of said lamp bodies comprises substantially a narrow, rectangular prism casing defining said interior as a narrow channel and having an opening at a first longitudinal narrow side of said narrow channel of said rectangular prism casing from which light from said bulb emerges, said light bulb being mounted in the channel adjacent a second longitudinal narrow side of said narrow channel of said rectangular prism casing opposite and spaced from said opening and being parallel longitudinally thereto,

said second longitudinal narrow side of said narrow channel

of said rectangular prism casing has formed thereon a convex surface facing toward said opening,

said rectangular prism casing has a narrowest width adjacent said second longitudinal narrow side substantially equal to the width of said bulb, and



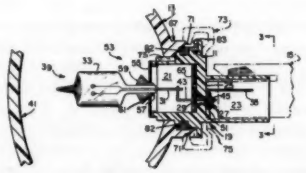
said rectangular prism casing having a longitudinal length and height which is large relative to said narrowest width of said rectangular prism casing.

4,528,619

REPLACEABLE LAMP UNIT PROVIDING HERMETIC SEAL AND FIXED ALIGNMENT FOR ELECTRIC LAMP CONTAINED THEREIN AND AUTOMOBILE HEADLIGHT UTILIZING SAME

Richard J. Dolan, Bradford; Frank Cangiano, Hillsboro, and John Van der Linde, Deering, all of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 24, 1983, Ser. No. 507,389
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—61 **31 Claims**



1. A replaceable lamp unit for being removably positioned with a rear opening of a reflector of an automobile headlight and for being electrically connected to an external connector forming part of electrical circuitry of said automobile, said replaceable lamp unit comprising:

an electrically insulative holder for being positioned within said rear opening of said reflector, said holder defining first and second cavities therein and a wall member located between said cavities, said wall member including at least two spaced apart substantially conical-shaped apertures therein;

at least two substantially conical-shaped electrically conductive members, each of said electrically conductive members positioned within a respective one of said apertures in corresponding shape orientation within said wall member;

at least two electrically conductive lug members located within said second cavity of said electrically insulative holder and adapted for being electrically connected to said external connector when said connector is positioned within said second cavity, each of said lug members having means for being mechanically connected to a respective one of said substantially conical-shaped electrically conductive members in such a manner so as to fixedly secure said conductive members within said substantially conical-shaped apertures in a sealed fashion and to provide an electrical connection between each of said lug members and said respective conductive members solely by said means; and

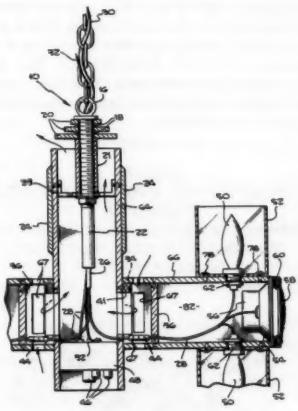
an electric lamp securedly positioned within said insulative holder, said lamp including an envelope projecting from said holder and adapted for being oriented within said reflector when said holder is positioned within said rear opening thereof and at least two electrically conductive lead-in wires projecting from said envelope and extending substantially within said first cavity of said holder, each of said lead-in wires being electrically connected to a respective one of said substantially conical-shaped, electrically conductive members fixedly secured within said substantially conical-shaped apertures of said holder, said electrical connection between each of said electrically conductive members and said respective one of said lead-in wires providing both a hermetic seal therebetween and also serving to maintain said electric lamp in a substantially fixed position within said holder.

4,528,620

AUDIO LIGHT CHANDELIER

Franz K. Weber, Canoga Park, Calif., assignor to Modulite Corporation, Los Angeles, Calif.

Filed Jan. 23, 1984, Ser. No. 572,939
Int. Cl.³ H04M *1/22*
U.S. Cl. 362—86 **9 Claims**



1. A composite illumination and audio system comprising, in combination:

a mechanical structure adapted to be suspended from a wall or ceiling in spaced relation thereto;

an illuminating system supported by said mechanical structure;

an audio system also supported by said mechanical structure;

said mechanical structure providing a resonant cavity for said audio system;

an electrical power supply circuit for furnishing electrical power both to said illuminating system and to said audio system; and

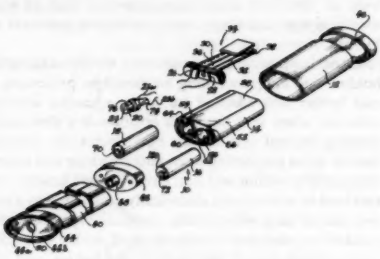
a chimney providing a positive air-flow ventilation system to provide air cooling for said illuminating system, said audio system and said electrical power supply circuit.

4,528,621

FLASHLIGHT

Robert Hoyt, 900 S. Edson St., Lombard, Ill. 60148

Filed Mar. 5, 1984, Ser. No. 586,062
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—189 **5 Claims**



1. A flashlight comprising

a housing having a flexible side wall, adapted to be inwardly and resiliently flexibly deformed to energize and light said flashlight;

a battery retaining case adapted to hold a pair of batteries in spaced relation;

a light bulb having at least two electrical leads for electrical connection with the batteries;

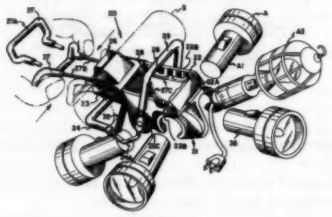
a membrane switch means including a flexible, flat insulator strip between said housing and said retaining case, said membrane switch means including a head portion for connecting the leads of said bulb with said batteries, said membrane switch means including a first and second conductor bonded on said flexible substrate insulator strip, said conductors terminating in a first and second switch contact, said membrane switch means having a resiliently folded portion carrying said switch contacts so that when the housing is flexibly deformed said first and second switch contacts are connected to complete an electrical path through said conductors on said insulator strip means to energize said flashlight.

4,528,622

CLAMPING DEVICE AND ARTICLE HOLDER THEREFOR

Joseph G. Bacevius, 780 Bridgeport Ave., Shelton, Conn. 06484

Filed Dec. 3, 1982, Ser. No. 446,519
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—396 **16 Claims**



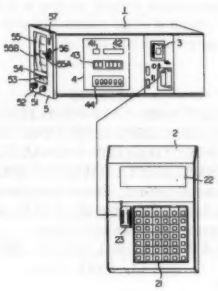
1. A multi-positional device holder comprising an elongated tubular like body having a top portion and connected opposed side walls dependently connected to said top portion, said tubular body being generally arcuate in cross-section defining a circumference of less than 360° and more than 180°, said tubular like body terminating in opposed longitudinally aligned arcuate end openings whereby said tubular like body is adapted to frictionally receive and retain a device therein so that the retained device extends longitudinally of said tubular like body, and said opposed side walls having formed therein opposed arcuate shaped side openings disposed therein intermediate the length of said opposed side walls, said walls, said side openings each having a circumference of less than 360° and more than 180°, and said side openings being adapted to frictionally recieve and retain a device therein so as to extend transversely of said tubular body, said side openings being coaxially disposed substantially normal to the longitudinal axis of said tubular like body, whereby the axis of said side openings extend across the longitudinal axis of said tubular like body.

4,528,623

CONTROLLER WITH PROGRAMMER FOR SELECTIVELY PROVIDING PROGRAMS TO OPERATE CONTROLLER

Kouji Tachibana, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,810
Claims priority, application Japan, Dec. 5, 1980, 55-170955
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—191 **7 Claims**



1. A controller for process control comprising:

a programmer including memory means for encoding and storing a plurality of computing elements which may be combined to form programs necessary for determination of functions of the controller, key board means having plural keys for reading those computing elements stored in said memory means required for a selected program in response to depression of selected keys labeled with instrumentation terms identifying the program function, and means for producing a computing program for a desired function from said read out computing elements in response to depression of said keys of the key board;

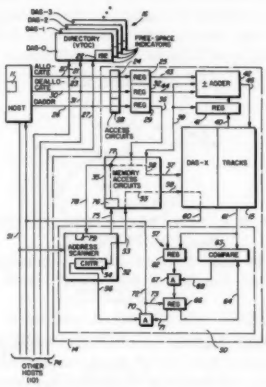
program memory means removably connected to said programmer for storing the computing programs produced by said programmer, said program memory means comprising a physically unpluggable programmable memory; and

an arithmetic processing portion having register means for storing input signals, arithmetic means selectively connectable to said programmable memory for interpreting the codes of the computing programs stored in said program memory means and for executing an interpreted program on the basis of the data stored in said register means, and output means for outputting data obtained as a result of executing the computing program by said arithmetic means, said arithmetic processing portion being at no time electrically connected to said programmer.

4,528,624
METHOD AND APPARATUS FOR ALLOCATING MEMORY SPACE BASED UPON FREE SPACE IN DIVERSE MEMORY DEVICES

Harvey E. Kamionka; Jerry W. Pence, and Dat M. Tran, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1981, Ser. No. 247,198
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—200 **7 Claims**



1. The machine-implemented method of balancing activity of a plurality of peripheral data storage devices having diverse data storage capacities, each device having a plurality of allocatable memory segments, including the steps of:

maintaining a running tally for each of said plurality of data storage devices for indicating the number of currently unallocated memory segments therein;

memorizing said running tallies for all of said storage devices in a central data memory, such that the memorization is a running tally for all of said unallocated memory segments in all of said data storage devices;

executing a program of instructions, in any one of a plurality of hosts using said storage devices, that examines said tallies and determines and identifies which of said storage devices has the greatest tally;

allocating new work to said storage devices in a sequence based upon said tallies including biasing said work allocations to those storage devices with larger unallocated memory segment tallies; and

in allocating new work to said storage devices, scanning said central memory for a largest one of said memorized tallies, identifying a one of said storage devices as the storage device having the largest unallocated space and allocating work to said identified one of said storage devices.

4,528,625
INPUT/OUTPUT INSTRUCTION EXECUTION IN MICROCOMPUTER

Kevin C. McDonough, and Surendar S. Magar, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 11, 1982, Ser. No. 348,125
Int. Cl.³ G06E *9/40*
U.S. Cl. 364—200 **12 Claims**

1. A microcomputer system comprising:

a microcomputer device formed in a single integrated circuit and having data input/output terminals and address output terminals;

memory means external to the microcomputer device having an address input and data output means;

external address bus means coupled to the address output terminals of the microcomputer device and to the address input of the memory means;

external data bus means coupled to the data input/output terminals of the microcomputer device and to the data output means of the memory means;

the microcomputer device comprising:

an arithmetic/logic unit having data input and data output;

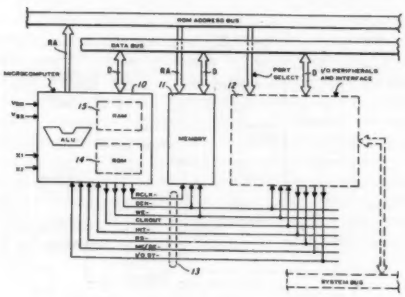
a data memory having an address input and having data input/output means;

internal data bus means coupled to the data input and data output of the arithmetic/logic unit and coupled to the data input/output means of the data memory;

an internal program memory having an address input and having an instruction output, the program memory storing instruction words;

program address means connected to the address input of the program memory means;

control means having an input for receiving instruction words, said control means generating controls in response to instruction words of at least two types including a first



type executed solely within said device and a second type requiring access to said external data bus means, the controls defining operation of the arithmetic/logic unit and transfer to and from the internal bus means and external bus means;

internal program bus means coupled to said instruction output, to said data input/output terminals, to said input of said control means, and to said program address means; said instruction words being transferred from said instruction output or said data input/output terminals to said input of said control means via said internal program bus means;

timing means for establishing overlapping operating cycles during any one of which data may be transferred from the data memory to the data input of the arithmetic/logic unit, the program address means applies an address to the address input of the program memory, and the control means receives an instruction word from the instruction output; instruction words of said first type employing one of said cycles.

4,528,626
MICROCOMPUTER SYSTEM WITH BUS CONTROL MEANS FOR PERIPHERAL PROCESSING DEVICES

Mark E. Dean, Boynton Beach, and Dennis L. Moeller, Delray Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1984, Ser. No. 589,692
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **8 Claims**

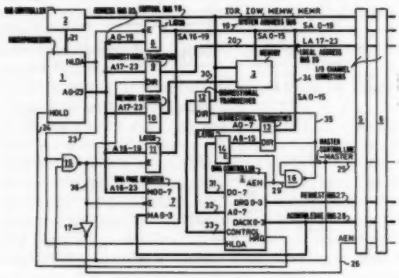
1. A microcomputer system comprising:

a main processor, a memory system, a plurality of input/output channels, wherein the main processor is operatively

connected to said memory and to said input/output channels;

a direct memory access controller operatively connected between said memory and said input/output channels, said direct memory access controller operable to control direct data transfer between the memory and input/output devices on the input/output channels, said direct memory access controller being responsive to an individual request signal from an input/output channel to generate a hold request signal for the processor, which in response thereto, switches to a hold condition in which it relinquishes control of the system address, data, and control busses and issues a hold acknowledge signal to which the direct memory access controller responds by gaining control of the busses, by issuing an address enable signal, and by issuing a further acknowledge signal to the requesting input/output channel for said direct data transfer between that input/output channel and the memory;

said microcomputer system including a master control line coupled commonly to all of the input/output channels, said master control line being activated by a requesting peripheral processor operatively coupled to one of the



input/output channels in response to said further acknowledge signal applied to the input/output channel corresponding to the requesting peripheral processor;

said master control line coupled to a logic means responsive to the activation of said master control line to remove control of said system busses from said direct memory access controller and from said main processor and thereby to transfer control of said system to the requesting peripheral processor;

said logic means including a first bidirectional transceiver coupling high order address bits to either memory or input/output channels within the system and to determine whether said main processor, said direct memory access controller, or said peripheral processor has momentary control of said system; and

said master control line further coupled to the control input of said transceiver whereby whenever said master control line is deactivated, said high order bits are passed to a memory select decoder so that either the main processor or direct memory access controller have system control and whenever said master control line is deactivated, said high order bits are passed through said transceiver so that the peripheral processor has system control.

4,528,627

METHOD FOR CEPHALOMETRIC QUANTITATION AND EXPRESSION OF GROWTH

Eugene S. Coben, 956 Coates Rd., Meadowbrook, Pa. 19046

Filed Nov. 12, 1982, Ser. No. 441,283

Int. Cl.[3] **G06G** *7/60*

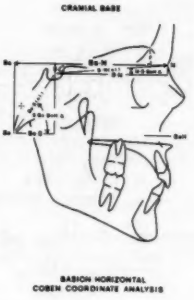
U.S. Cl. 364—415 **10 Claims**

1. A method for the cephalometric quantitation and expression of growth of a patient comprising the steps of:

(a) taking a lateral cephalometric X-ray of a patient having a predetermined enlargement factor by fixing the X-ray source/head midsagittal plane distance;

(b) registering an analyzer with said X-ray such that said analyzer is registered at the anatomic landmark basion and oriented with the horizontal components of said analyzer paralleling the X-ray Frankfort Horizontal plane of said X-ray;

(c) registering anatomic landmarks of cephalometric regions having contributing variants sought to be quantified with



said analyzer, said regions selected from the group consisting of cranial base, facial depth, facial height, dentition, and profile, wherein said registering step includes generating the linear size, proportions and angular relationships of said variants;

(d) summating the linear size, proportions and angular relationships of said variants for the cephalometric regions using said analyzer; and

(e) retaining the results of said summating step for future reference in treatment of said patient.

4,528,628

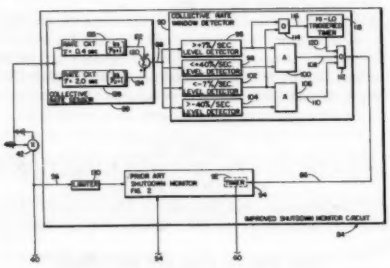
SHUTDOWN MONITOR FOR A HELICOPTER PITCH BIAS ACTUATOR

William C. Fischer, Monroe; Don L. Adams, Fairfield; Stuart C. Wright, Milford; David J. Verzella, Guilford, and Arthur L. Sivigny, Bridgeport, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1982, Ser. No. 447,360

Int. Cl.[3] **B64C** *11/34;* **G06F** *15/20*

U.S. Cl. 364—424 **12 Claims**



1. An improved pitch bias actuator (PBA) shutdown monitor of the type which detects a difference value between a PBA position command signal provided as a function of positioning of a collective pitch control and an actual sensed PBA position signal and which, in response to a selected difference value therebetween, provides an actuator shutdown signal to a PBA disable circuit to disable actuator operation, wherein the improvement comprises:

sensor means responsive to the collective pitch control for providing a signal indicative of the rate of change of collective pitch control position, and

shutdown inhibit means, including means for defining a selected range of collective pitch control position rate signal values bounded by a slow rate limit signal value and a fast rate limit signal value; and responsive to said sensor means for comparing said sensed collective pitch control position rate signal magnitude to said range of collective rate signal values and providing, in response to said sensed rate signal magnitude within said selected range of rates, an inhibit signal to the PBA disable circuit to prevent disable circuit response to an actuator shutdown signal.

4,528,629

ELECTRONIC CONTROL APPARATUS WITH DEFINED RESET FUNCTION

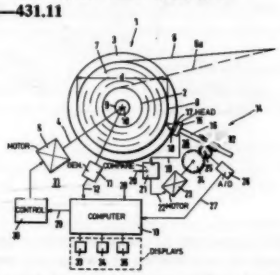
Wolfram Breitling, Sachsenheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,625

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119117

Int. Cl.³ G06F *1/04, 9/22*

U.S. Cl. 364—431.11 **8 Claims**



1. Post-interruption resetting system for electronic control apparatus (7) having

a clock generator (1) connected to supply clock pulses to the electronic control apparatus;

and a reset control terminal (7*a*) connected to and selectively controlling resetting and operation of the electronic control apparatus (7), in dependence on a characteristic of a control signal applied to the reset terminal (7*a*) and holding said control apparatus (7) in reset condition until change of the characteristic of said control signal;

comprising, in accordance with the invention,

means (2, 3, 5) connected to the clock generator for sensing oscillatory output of the clock generator and providing an output signal when the oscillatory output is at a level sufficient for stable operation of said electronic control apparatus (7);

and circuit means (6*a*, 6) connecting the output signal of said oscillation level sensing means to the reset control terminal (7*a*) of said electronic control apparatus upon sensing operation of the clock generator at a level sufficient for stable operation of the electronic control apparatus (7),

said output signal of the sensing means changing the characteristic of the control signal being applied to the reset terminal (7*a*) of the electronic control apparatus (7) to enable operation of the electronic control apparatus only when the clock signals supplied thereto are at said level sufficient for stable operation of the electronic control apparatus.

4,528,630

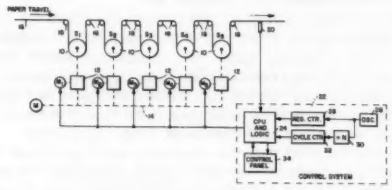
AUTOMATIC REGISTRATION CONTROL METHOD AND APPARATUS

Jack Sargent, Silver Spring, Md., assignor to OAO Corporation, Greenbelt, Md.

Filed Sep. 14, 1982, Ser. No. 418,183

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—469 **39 Claims**



1. A method of registration control in a multi-station processing system, comprising applying to a running web at a first station a pair of reference marks in accordance with a location on the web of a first processing operation performed by said first station, said reference marks being spaced along the length of the web; applying to the web at a second station a control mark in accordance with a location of a second processing operation performed by said second station, said control mark being applied between said reference marks; measuring a first quantity dependent upon the space between said reference marks; measuring a second quantity dependent upon a position of the control mark with respect to one of the reference marks; and analyzing the first and second quantities to detect misregistration.

4,528,631

PROCESS FOR THE CONTROL OF WARPING SPEED AND A DIRECT WARPING MACHINE FOR CARRYING OUT THIS PROCESS

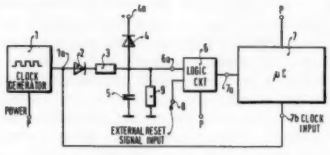
Bogdan Bogucki-Land, Offenbach, Fed. Rep. of Germany, assignor to Karl Mayer Testilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,123

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219132

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—470 **12 Claims**



1. An arrangement for controlling the warping speed of a directly warped warp beam rotating at a known angular speed by regulating, toward a predetermined projected value, the linear speed of transfer of thread windings with respect to said beam, comprising:

transducer means mounted adjacent said warp beam for measuring its diameter without touching it and for provid-

ing a diameter signal signifying the wound diameter of said warp beam;

comparison means coupled to said transducer means for providing a command signal as a predetermined function of said diameter signal and said known angular speed, said comparison means including means for storing a velocity value equivalent to said known angular speed and for calculating and varying said command signal in response to said velocity value and said diameter signal according to said predetermined function; and

control means coupled to said comparison means for controlling the rate of rotation of said warp beam in response to said command signal, said comparison means being operable to vary said command signal to reduce the rate of rotation of said beam in response to a change in said diameter signal indicating an increase in the wound diameter of said warp beam, said transducer means comprising:

a measuring head mounted alongside said warp beam for moving at least radially with respect thereto and for providing a head signal related to the spacing between said head and windings on said beam;

an adjuster for radially moving said measuring head; and

a control circuit coupled to said adjuster and measuring head for operating the former to maintain the latter at a predetermined distance from windings on said warp beam in response to said head signal, said diameter signal bearing a predetermined relationship to the positioning caused by said control circuit through said adjuster.

4,528,632

INDUSTRIAL ARTICULATED ROBOT LINEAR INTERPOLATION CONTROL DEVICE

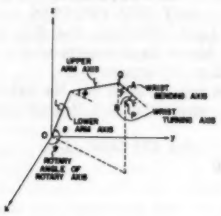
Satoru Nio; Shinobu Sato; Shigemi Nobayashi, and Toyoji Hamashima, all of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukuoka, Japan

Filed Mar. 8, 1982, Ser. No. 355,657

Claims priority, application Japan, Mar. 18, 1981, 56-38872

Int. Cl.[3] G05B *19/41;* B25J *9/00, 13/00*

U.S. Cl. 364—169 **2 Claims**



1. In a control device for an industrial articulated robot which operates according to a teaching playback method, in which linear interpolation between two predetermined points is carried out, and dividing means are provided to divide a distance between said two points into segments which are determined by a command velocity, an interpolation time interval and the distance between said two points, said device having means for determining interpolation increments of motion along articulation drive axes, said interpolation increments corresponding to said segments, the improvement comprising: first means for changing the number of segments for every interpolation time interval so that, when a wrist axis speed is smaller than a speed corresponding to a maximum speed of revolution of a drive electric motor of said wrist axis, the orientation of said wrist is controlled to move at a uniform speed between said two points, and so that when said wrist axis speed exceeds the speed corresponding to the maximum speed of revolution of said drive electric motor, a second means changes the number of segments for every interpolation time interval so that the rate of movement in posture of said wrist does not exceed the speed corresponding to the maximum speed of revolution of said drive electric motor.

4,528,633

METHOD OF CONTROLLING INDEXING OF MAGAZINE POCKETS IN MACHINING CENTER

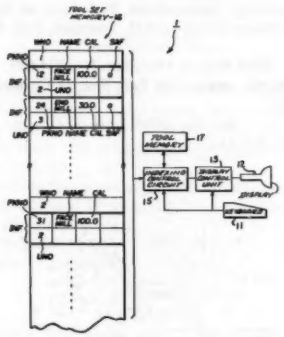
Takayoshi Sakai, Kagamihara; Shinji Sano, Konan, and Koji Matsumoto, Aichi, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Niwa, Japan

Filed Oct. 27, 1982, Ser. No. 437,170

Claims priority, application Japan, Nov. 5, 1981, 56-178074

Int. Cl.[3] G06F *15/46;* G05B *19/28*

U.S. Cl. 364—474 **5 Claims**



1. In a machining center having a magazine provided with a plurality of pockets each bearing its own pocket number, a tool set memory storing data corresponding to the means of the tools to be used and the pocket numbers of said pockets in said magazine in which said tools are stored for each of a plurality of machining programs for respective workpieces, and a display, a method of indexing of magazine pockets comprising the steps of:

setting tools in the magazine pockets in accordance with the pocket numbers corresponding to a first machining program stored in said tool set memory;

executing the first machining program;

comparing the tools names used in the first machining program with the tool means to be employed in a second machining program by reading out data corresponding to the names of the tools used in said second program from said tool set memory;

indexing, when there are identical tools used commonly in said first and second machining programs, the pocket numbers in the first machining program to the identical tools to be employed in the second machining program;

rewriting pocket number data corresponding to the identical tools used in said second machining program in said tool set memory in accordance with said indexed pocket numbers;

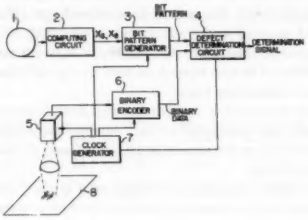
displaying data concerning said identical tools and the pocket numbers indexed thereto on said display; and

setting the tools for said second machining program by only mounting and demounting the tools that are not common to the first and second machining programs.

4,528,634
BIT PATTERN GENERATOR

Kozo Nakahata; Ikuo Kawaguchi, both of Yokohama, and Kazuo Yamaguchi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,405
Claims priority, application Japan, Oct. 9, 1981, 56-160173
Int. Cl.³ G06F *15/40*
U.S. Cl. 364—491 **6 Claims**



1. A bit pattern generator for generating, bit patterns of n bytes each including m bits, on the basis of a plurality of sets of pattern information each of which includes a start point address X_s having a start point byte address X_{sH} and a start point bit address X_{sL} and an end point address X_e having an end point byte address X_{eH} and an end point bit address X_{eL}, comprising:

a ROM having preliminarily stored model patterns in byte units any one of which is read out therefrom by designating a pair of address signals A_L and A_H;

a first latch circuit for holding said start point address X_s and providing said start point byte address X_{sH} and said start point bit address X_{sL} at its first and second outputs, respectively;

a second latch circuit holding said end point address X_e and providing said end point byte address X_{eH} and said end point bit address X_{eL} at its first and second outputs, respectively;

an address counter for receiving said start point byte address X_{sH} from said first latch circuit to provide a byte address X_{CNT};

logical operation means which receives said start point byte address X_{sH} and said start point bit address X_{sL} from said first latch circuit, said end point byte address X_{eH} and said end point bit address X_{eL} from said second latch circuit, and said byte address X_{CNT} from said address counter to produce an output representative of a comparison between X_{eH} and X_{CNT} and logical operation outputs representative of said pair of address signals A_L and A_H, said address signals A_L and A_H being supplied to said ROM;

a sequence control circuit for receiving the comparison output from said logical operation means to increment said address counter when $X_{eH} \neq X_{CNT}$;

RAM means having a storage area of at least m bits by n bytes, the writing position to said RAM means being controlled by the byte address from said address counter; and

a gate circuit located between said ROM and said RAM means for writing the output of said ROM into said RAM means.

4,528,635
AUTOMATIC DISTILLATION APPARATUS

Peter Juodikis, Chicago, and Steven J. Martinich, Wheaton, both of Ill., assignors to GCA Corporation, Bedford, Mass.

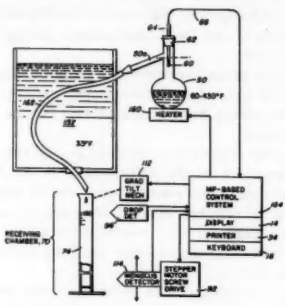
Filed Jun. 7, 1982, Ser. No. 386,044
Int. Cl.³ B01D *3/42*
U.S. Cl. 364—501 **23 Claims**

1. Automatic distillation apparatus of the type having a sample heater, means for condensing the sample vapor and vessel means for receiving the distillate as the vapor is condensed, wherein the improvement comprises

means for receiving and storing operator commands,

means responsive to said commands for establishing first and second heater time intervals,

first servo control means responsive to said commands for supplying power to said heater at a first predetermined level during said first interval and at a different second predetermined level during said second interval,



means for detecting the initial boiling point of the sample for producing an IBP signal indicative thereof,

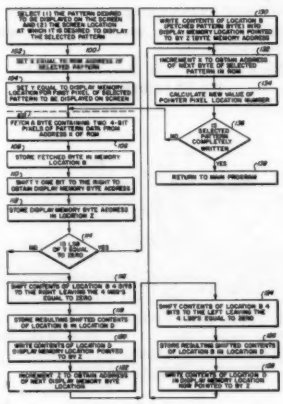
means responsive to said IBP signal for disabling said first servo control means, and

means responsive to the timing of said IBP signal in relation to said first and second intervals for issuing a control signal indicative of the occurrence of the IBP signal before or during said second time interval.

4,528,636
DISPLAY MEMORY WITH WRITE INHIBIT SIGNAL FOR TRANSPARENT FOREGROUND PIXEL CODES

Irwin J. Robinson, III, Mesa, Ariz., assignor to Intermark Industries, Inc., Phoenix, Ariz.

Filed Oct. 19, 1981, Ser. No. 312,719
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—521 **21 Claims**


SET X EQUAL TO ROM ADDRESS OF SELECTED PATTERN
SET Y EQUAL TO DISPLAY MEMORY LOCATION FOR NEXT PIXEL OF SELECTED PATTERN TO BE DISPLAYED ON SCREEN
FETCH A BYTE CONTAINING TWO 4-BIT PIXELS OF PATTERN DATA FROM ADDRESS X OF ROM
STORE FETCHED BYTE IN MEMORY LOCATION B
SHIFT 1 ONE BIT TO THE RIGHT TO OBTAIN DISPLAY MEMORY BYTE ADDRESS
STORE DISPLAY MEMORY BYTE ADDRESS IN LOCATION Z
IS LOW ORDER 4 BITS OF X EQUAL TO ZERO?
SHIFT CONTENTS OF LOCATION B 4 BITS TO THE RIGHT, LEAVING THE 4 HIGH'S EQUAL TO ZERO
STORE RESULTING SHIFTED CONTENTS OF LOCATION B IN LOCATION D
WRITE CONTENTS OF LOCATION D TO DISPLAY MEMORY LOCATION POINTED TO BY Z
INCREMENT X TO OBTAIN ADDRESS OF NEXT DISPLAY MEMORY BYTE LOCATION
WRITE CONTENTS OF LOCATION B TO PIXEL PATTERN BYTE) FOR DISPLAY MEMORY LOCATION POINTED TO BY Z (BYTE MEMORY ADDRESS
INCREMENT X TO OBTAIN ADDRESS OF NEXT BYTE OF SELECTED PATTERN IN ROM
CALCULATE NEW VALUE OF POINTER PIXEL LOCATION NUMBER
SELECTED PATTERN COMPLETELY WRITTEN?
RETURN TO MAIN PROGRAM
SHIFT CONTENTS OF LOCATION B 4 BITS TO THE LEFT, LEAVING THE 4 LSB'S EQUAL TO ZERO
STORE RESULTING SHIFTED CONTENTS OF LOCATION B IN LOCATION D
WRITE CONTENTS OF LOCATION D IN DISPLAY MEMORY LOCATION NOW POINTED TO BY Z

1. A method for writing patterns into a display memory coupled to a display device by means of which the patterns are to be displayed,

each of the patterns being stored in the from of pixel codes

each indicating the brightness of color of a corresponding pixel of the display device when that pattern is displayed, each of said pixel codes indicating whether its corresponding pixel is to be considered transparent,

said method comprising the steps of:

(a) using a processor to select a background pattern, and writing the background pattern into said display memory;

(b) using the processor to select a foreground pattern and to select a location of the display memory whereat the selected foreground pattern is to be displayed, some of the pixels of said foreground pattern having transparent pixel codes;

(c) using the processor to obtain a foreground pattern data word of the selected foreground pattern, said foreground pattern data word including at least one of said pixel codes;

(d) using the processor to transmit at least one pixel code representative of the information in the foreground pattern data word, a write signal, and an address representing the selected location, from the processor to the display memory, said transmitting being performed after the background pattern has been written into the display memory;

(e) using a sensing circuit external to the processor to effectuate sensing each transmitted pixel code, without reference to the background pattern, to determine if its corresponding pixel is to be considered transparent;

(f) for each foreground pixel code transmitted,

(i) enabling said write signal to cause writing of that pixel code into the addressed location of the display memory in response to said sensing circuit on the condition that said sensing indicates that the pixel corresponding to that pixel code is not to be considered transparent, or

(ii) inhibiting said write signal to prevent writing of that pixel code into the addressed location of the display memory in response to said sensing circuit on the condition that said sensing indicates that the pixel corresponding to that pixel code is to be considered transparent and therefore is not to be written into said display memory system.

4,528,637

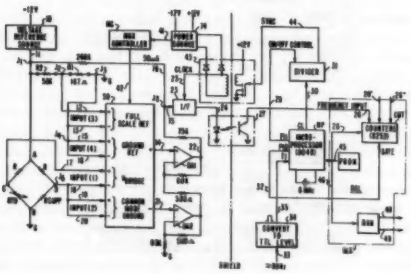
DATA ACQUISITION SYSTEM AND ANALOG TO DIGITAL CONVERTER THEREFOR

Yoav M. Smith, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 17, 1982, Ser. No. 389,512

Int. Cl.³ G01K 7/16

U.S. Cl. 364—557 **2 Claims**



1. In a system for monitoring temperature and deriving signals representative of temperatures sensed at a remote location with a Resistance Thermometer Device (RTD) having a resistance R_i when exposed to a temperature T_i, the combination of:

a voltage reference source of voltage V_{REF} at said remote location;

a voltage divider at said remote location connected between said voltage reference source and ground;

said voltage divider having an intermediate divider point situated thereon between said voltage reference source and ground;

a bridge at said remote location having two supply ends respectively connected to said voltage reference source and ground and having two measuring ends diagonally disposed relative to said supply ends, with said RTD being mounted in one branch of said bridge in relation to one of said measuring ends;

a data acquisition system having four inputs selected and remotely connected to said remote location through individual lines associated with one of said divider and bridge as follows:

a first input connected between said bridge measuring ends;

a second input connected to the other of said measuring ends for the derivation of common ground;

a third input connected between said intermediate divider point and ground;

a fourth input connected to ground as a reference ground therefor;

said data acquisition system having counter means for deriving a representative count in response to a selected said input;

where C_i is the representative count when said first input is responsive to an input signal X_i, the voltage signal X_i corresponding to the resistance R_i and the temperature T_i;

where C_{gs} is a count representative of ground derived from said third input when selected;

where C_g is a common ground representative count derived from said fourth input when selected;

a microprocessor being provided operative with such count C_i for computing a linearized representative value Y_i of X_i according to the formula:

$$Y_i = B_0 + B_1X_i + B_2X_i^2 + \sum_{n=3}^{\infty} B_nX_i^n \sum_{n=3}^{\alpha} B_jX_j$$

where:

$$B_0 = 0;\ B_1 = 1 + \frac{2R_{cold}}{R};$$

$$B_2 = 1 + \left(\frac{2R_{cold}}{R}\right) \times \frac{1}{KFS};$$

$$B_3 \doteq 1 + \left(\frac{2R_{cold}}{R}\right) \times \left(\frac{1}{KFS}\right)^2; \text{ etc.}$$

where R_{cold} is the resistance value of R_i for $T_i = T_{cold}$; where R is the resistance of a resistor in the bridge inserted in series between said RTD and said voltage reference source; where FS is the full-scale reading resolution of the data acquisition system; and where 1/K is a fraction representing the ratio of the voltage reference V_{REF} from the voltage reference source to said full-scale reading resolution FS;

whereby from said second input is derived an input signal representing V_{REF}/K;

with said microprocessor being operative with said first, second, third and fourth selected input to compute X_i by the formula:

$$X_i = \frac{C_i - C_g}{C_{FS} - C_{gs}} \times FS$$

and said microprocessor being operated, for each value X_i so derived, to convert the computed count X_i to a linear count Y_i.

4,528,638

SHOPPING CALCULATOR WITH COMPARISON FEATURE

Koichi Hatta, Yamatokoriyama, and Kenichiro Komeda, Gose, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,278

Claims priority, application Japan, Sep. 17, 1981, 56-147101; Sep. 30, 1981, 56-157157

Int. Cl.[3] **G06F** *15/20*

U.S. Cl. 364—709 **8 Claims**

1. A shopping calculator for computing the accumulated total price of selected products to be purchased and comparing said accumulated total price to a predetermined budget value comprising:

(a) memory means for storing data;

(b) data entry key means including,

(1) budget key means for entering said budget value into said memory means, and

(2) amount key means for entering the product prices of selected ones of a plurality of different products into said memory means;

(c) arithmetic logic means for computing said accumulated total price of product prices input by said amount keys and the difference between said accumulated total product price and said budget value;

(d) warning means for generating a warning signal when said difference is less than a preset value; and

(e) display means for simultaneously displaying said budget value and said difference.

4,528,639

METHOD OF AND APPARATUS FOR GENERATING AN INERSTITIAL POINT IN A DATA STREAM HAVING AN EVEN NUMBER OF DATA POINTS

Thomas R. Edwards, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,917

Int. Cl.[3] **G06F** *7/38;* **G06G** *7/28, 7/30*

U.S. Cl. 364—723 **11 Claims**

1. Apparatus for generating an interstitial point in a data set having an even number of data points comprising:

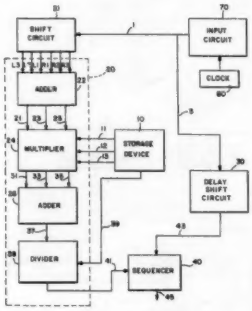
(a) storage means for storing a set of convolute integer coefficients, which set includes a set of multiplier coefficients and a normalizer coefficient;

(b) input means for supplying said data set;

(c) interpolator means receiving said set of predetermined convolute integer coefficients and said data points for applying said coefficients to said data points by weighting on each side of the center of said data points to obtain an interstitial point at said center, said interpolator means comprising:

(d) first adder means having a set of inputs each of which receive one of said data points from said input means, for generating a set of first addition signals in which each signal represents the sum of a pair of said data points which is symmetrical with respect to the center of said data points;

(e) multiplier means having a first set of inputs for receiving said set of first addition signals and a second set of inputs for receiving said set of multiplier coefficients for generating a set of multiplication signals, each multiplication signal representing the product of one input of said first set of inputs with one input of said second set of inputs in accordance with a predetermined one-dimensional convolute integer weighting scheme;



(f) second adder means having a set of second adder inputs each of which receives one signal of said set of multiplication signals for generating a second addition signal which represents the sum of addition signals at said set of second adder inputs; and

(g) divider means receiving said second addition signal and said normalizer coefficient for generating a division signal representing the quotient produced by dividing said second addition signal by said normalizer coefficient, whereby the amplitude of said division signal represents said interstitial point.

4,528,640

METHOD AND A MEANS FOR CHECKING NORMALIZING OPERATIONS IN A COMPUTER DEVICE

Peter B. Criswell, Bethel, Minn., assignor to Sperry Corporation, New York, N.Y.

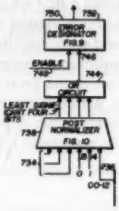
Filed Jul. 13, 1982, Ser. No. 397,760

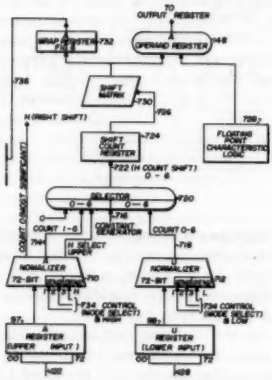
Int. Cl.[3] **G06F** *11/00*

U.S. Cl. 364—737 **13 Claims**

4. A normalizer throughchecking circuit comprising a post normalizer circuit connected to the main normalizer circuit of an arithmetic unit of a data processing system; shift/nonshift indicating means for indicating a shift or a non-shift condition of said post normalizer circuit connected to said post normal-

izer circuit; and error/non-error indicating means connected to said shift/nonshift indicating means for indicating an error





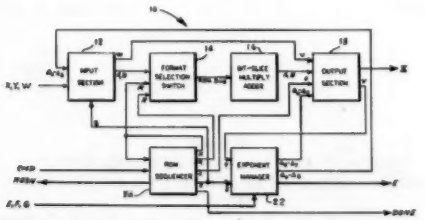
signal when a shift is indicated and a non-error signal when a non-shift is indicated.

4,528,641

VARIABLE RADIX PROCESSOR

James L. Burrows, Merrimack, N.H., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 16, 1982, Ser. No. 442,212
Int. Cl.³ G06F *7/52*
U.S. Cl. 364—757 **14 Claims**



1. A variable radix processor for performing computations upon a plurality of variable signals in accordance with a predetermined algorithm comprising

means for changing form of said plurality of variable signals input therein, each of said variable signals being composed of sequential digital words having a plurality of bits therein, said means for changing form outputting at least one output signal, each of said output signals being composed of a plurality of parallel words having parallel bits therein;

a format selection switching means for controlling a first portion of an address format, said format selection switching means including a plurality of parallel switches equal in number to the number of bits per word in said variable signals, each of said switches receiving bits of a different order from said means for changing form, said switches outputting a plurality of parallel address bits based upon said predetermined algorithm;

means for providing a second portion of said address format, said second portion including radix value select bits and coefficient select bits for said processor, said radix value select bits and said coefficient select bits being a plurality of parallel bits based upon said predetermined algorithm of said processor and a command signal input to said variable radix processor;

a bit-slice multiply-adder that has input said first and second portions of said address format from said format selection switching means and said means for providing a second portion; said multiply-adder including a plurality of multiply-add circuits, each of said multiply-add circuits being addressed by said address format, each of said multiply-add circuits including a plurality of parallel memory means equal in number to the number of bits in said word, tally cascade means and adder means, said parallel memory means having stored therein a first unique word for each of a plurality of address format values based upon said predetermined algorithm, said parallel memory means outputting said unique word to said tally cascade means, said tally cascade means outputting a tallied word to said adder means, said adder means outputting a second unique word in parallel bits for each address format value; and

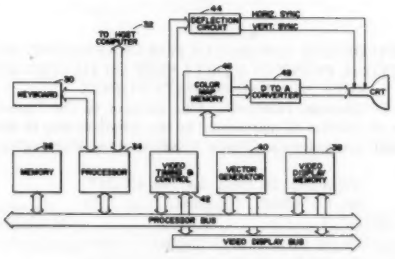
outputting means for receiving a plurality of unique words from said bit-slice multiply adder.

4,528,642

COMPLETING A FILL PATTERN INSIDE A REDRAWN PANEL OUTLINE

William G. Waller, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 12, 1982, Ser. No. 367,709
Int. Cl.³ G06F *3/00, 15/00*
U.S. Cl. 364—900 **5 Claims**



1. In a graphics display terminal having a CRT capable of displaying at least one panel image thereon in response to instructions from a main memory source, said terminal also being capable of performing a zoom operation and a panel-fill operation for filling the displayed panel with a predetermined fill pattern, an improvement comprising:

input means for introducing information into said graphics display terminal related to said zoom operation;

first means for processing said instructions from said main memory source and said information introduced via said input means including: a means for designating a portion of the display on the CRT that is to be subjected to the

zoom operation in response to said information, a means for determining whether a particular pixel within the designated display portion is within said at least one panel, a means for implementing the zoom operation on the designated portion to produce a representation of an enlarged designated portion, and a means for implementing a panel-fill operation for a filling of only said panel or any part thereof in the enlarged designated portion with the same corresponding fill pattern in response to the location of the particular pixel to produce a representation of a filled enlarged designated portion;

second means responsive to output from the first means for producing a pixel representation of said filled enlarged designated portion;

converting means responsive to said pixel representation produced by the second means for converting said pixel representation into video signals representative of said representation of the filled enlarged designated portion; and

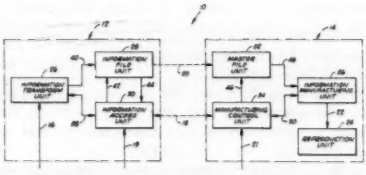
display means responsive to the video signals.

4,528,643

SYSTEM FOR REPRODUCING INFORMATION IN MATERIAL OBJECTS AT A POINT OF SALE LOCATION

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to FPDC, Inc., Oklahoma City, Okla.

Filed Jan. 10, 1983, Ser. No. 456,730
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **56 Claims**



1. A method for reproducing information in material objects utilizing information manufacturing machines located at point of sale locations, comprising the steps of:

providing from a source remotely located with respect to the information manufacturing machine the information to be reproduced to the information manufacturing machine, each information being uniquely identified by a catalog code;

providing a request reproduction code including a catalog code uniquely identifying the information to be reproduced to the information manufacturing machine requesting to reproduce certain information identified by the catalog code in a material object;

providing an authorization code at the information manufacturing machine authorizing the reproduction of the information identified by the catalog code included in the request reproduction codes; and

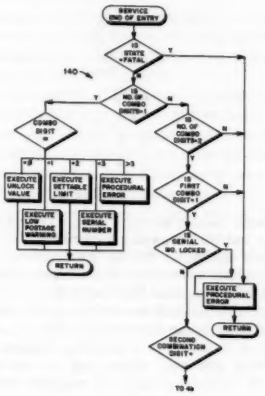
receiving the request reproduction code and the authorization code at the information manufacturing machine and reproducing in a material object the information identified by the catalog code included in the request reproduction code in response to the authorization code authorizing such reproduction.

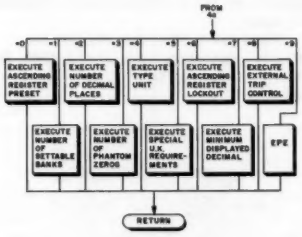
4,528,644

CUSTOMIZING THE FIRMWARE AFTER ASSEMBLY OF AN ELECTRONIC POSTAGE METER

John H. Soderberg, Stratford, and Edward C. Duwel, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 515,071
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—900 **41 Claims**





1. A method for customizing the firmware of an electronic postage meter after assembly, comprising the steps of:

storing a configuration program within the electronic postage meter which is capable of configuring the meter operation in response to configuration input messages entered therein;

storing operating programs within the electronic postage meter;

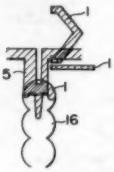
inputting input configuration messages into the electronic postage meter to select desired meter functions and provide input data for use with the operating programs stored in the meter; and

storing the input configuration data in the assembled meter under control of the configuration program for subsequent interaction with the operating programs of the meter to customize the meter operation to provide predetermined meter functions.

4,528,645
MAGNETIC BUBBLE MEMORY DEVICE

Yutaka Sugita, Tokorozawa; Ryo Suzuki, Kodaira; Naoki Kodama; Masatoshi Takeshita, both of Hachioji, and Tadashi Ikeda, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,344
Claims priority, application Japan, May 11, 1981, 56-69444
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—36 13 Claims

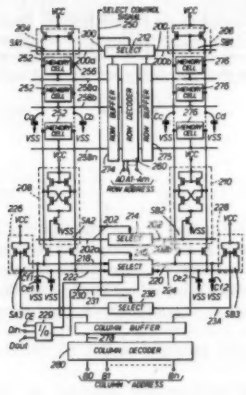


1. A magnetic bubble memory device comprising:
a magnetic bubble propagation circuit for forming a minor loop, said magnetic bubble propagation circuit being formed by implanting ions in a desired portion of a magnetic film for magnetic bubbles; and
a major line or a major loop, at least part of said major line or major loop being formed of a film of a soft magnetic material, at least part of connecting portions between said minor loop and said major line or major loop being formed of said film of said soft magnetic material.

4,528,646
SEMICONDUCTOR MEMORY WITH SELECTIVELY ENABLED PRECHARGE AND SENSE AMPLIFIER CIRCUITS

Kiyofumi Ochii, and Hiroshi Iwahashi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 6, 1982, Ser. No. 395,342
Claims priority, application Japan, Jul. 8, 1981, 56-106498
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—203 21 Claims

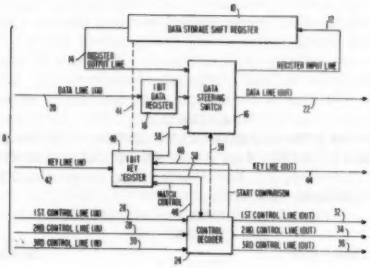


1. A semiconductor integrated memory device comprising:
a plurality of bit lines;
a plurality of memory cells each connected to at least one of said bit lines;
means for addressing said memory cells including a plurality of word lines divided into at least first and second sets, each of said memory cells being connected to at least one of said word lines, a plurality of means each for selectively enabling any of said work lines of said at least first and second sets, respectively;
at least two precharge means, at least first and second groups of said bit lines connected to those of said memory cells associated with said at least first and second sets of said word lines being connected to said at least two precharge means, respectively, said precharge means for precharging the associated group of said bit lines to an initial level; and
select means for selecting one of said bit line precharge means and a corresponding one of said enabling means.

4,528,647
WAFER SCALE INTEGRATED CIRCUIT MEMORIES

John T. Chamberlain, Banknock, United Kingdom, assignor to Burroughs Corp., Detroit, Mich.

Filed Oct. 28, 1981, Ser. No. 316,016
Claims priority, application United Kingdom, Jan. 7, 1981, 8100350
Int. Cl.[3] G11C *13/00*
U.S. Cl. 365—230 16 Claims

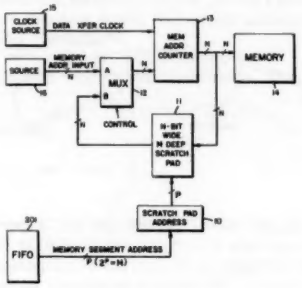


1. An integrated circuit for use in concatenating first and second memory blocks, comprising:
a plural location data store;
a through-passing data path for receiving a succession of data characters from said first memory block and for passing a succession of data characters to said second memory block;
a through-passing control path for receiving a succession of control characters from said first memory block and for passing a succession of control characters to said second memory block;
a through-passing address path for receiving a succession of key word address characters from said first memory block and for passing said succession of key word address characters to said second memory block;
a control decoder for monitoring the contents of said control path and for providing, in response to the received succession of control characters, a control signal output;
a data comparator for receiving said succession of key word address characters and operable, in response to said control signal output from said decoder, to compare said succession of key word address characters with the contents of a selectable succession of locations in said store and to detect a selectable one out of a plurality of magnitude relationships between said key word address characters and said contents of said succession of locations in said store and provide an indication of the magnitude relationship as an output signal; and,
a data switch responding to said control signal from said decoder and said magnitude relationship output signal from said data comparator to switch said data between said data path and said store, along said data path or within said store.

4,528,648
MEMORY MANAGEMENT SYSTEM

Eugene K. Lew, Sunnyvale, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,335
Int. Cl.³ G11C *8/00, 9/06*
U.S. Cl. 365—236 **5 Claims**

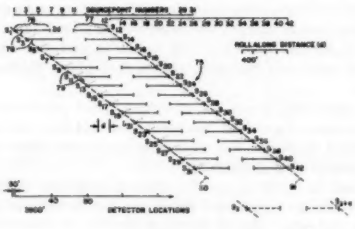


1. A shared memory system comprising,
storage memory means **(14)**,
scratch pad memory means **(11)**,
memory address means **(13)** connected to supply an address signal to said storage memory means to access the contents thereof and to concurrently supply said address signal to said scratch pad memory means thereby to store said address signal therein,
multiplexer means **(12)** connected to supply signals to said memory address means thereby to provide said address signal,
said scratch pad memory means connected to supply address signals to said multiplexer means which are selectively supplied to said memory address means,
source means **(16)** connected to said multiplexer means to selectively supply address signals to said memory address means via said multiplexer means, and
address register means **(10)** connected to the input of said scratch pad memory means to supply further address signals thereto.

4,528,649
EXPLORATION SYSTEM FOR DISCOVERING DEPOSITS OF ORE, MARKER ROCK AND/OR ECONOMIC MINERALS

Gary S. Gassaway; Henry J. Richgels, both of San Rafael, and James I. Foster, Novato, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 909,586, May 25, 1978, abandoned.
This application Feb. 26, 1981, Ser. No. 238,503
Int. Cl.³ G01V *1/20, 1/34*
U.S. Cl. 367—36 **12 Claims**

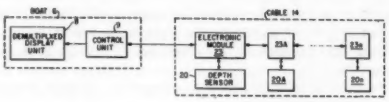


1. Method of accurately determining shape and elastic parameters of an earth formation to identify ore, marker rocks, economic minerals or the like, using a refraction exploration field system including a series of detectors, positioned along a line or survey at inline positions $X_1, X_2, \ldots X_n$ and at least one seismic source located adjacent to said detectors for producing a seismic wave for travel through said formation:
(a) generating a seismic wave at a first sourcepoint location adjacent said series of detectors;
(b) after said wave undergoes refraction, detecting arrival of a refracted wave at said series of detectors at said inline offset positions, to obtain a first set of traces associated with said offset positions $X_1, X_2, \ldots X_n$;
(c) repeating steps (a) and (b) by generating a second wave at a second sourcepoint adjacent to inline position X_n of said detector positions, and detecting said refracted wave to obtain a second set of traces;
(d) advancing said series of detectors a selected number of inline positions or fractions thereof and repeating steps (a), (b) and (c) above to obtain additional sets of traces, but in which said additional sets of traces are associated with more than two inline positions overlapping common inline positions of said first and second sets of traces;
(e) distinguishing arrival times of shear waves from compressional waves; and
(f) analyzing arrival times of at least one segment of (i) shear waves and (ii) compressional waves as a function of inline position whereby shape of said earth formation as well as elastic parameters indicative of likelihood of said formation being an ore, marker rock, economic mineral, and the like, are provided.

4,528,650
STREAMER CABLE MULTIPLEXING APPARATUS

Donald L. Howlett, Kingwood; Herbert J. Meyer, Bellaire, and Stanley F. Zimmer, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,741
Int. Cl.³ G01V *1/22*
U.S. Cl. 367—79 **9 Claims**



1. Apparatus for multiplexing ancillary devices in a streamer cable towed by a boat in ocean seismic operation, wherein a plurality of ancillary devices are located throughout the streamer cable, comprising
step pulse means located on the boat for providing step pulses,
means located on the boat for providing control signals,
control voltage means located on the boat for providing control voltages,
a plurality of control pulse means located in the streamer cable and connected in series with the first control pulse means being connected to the step pulse means and said plurality of control pulse means being responsive to the step pulses for providing a plurality of control pulses in a predetermined sequence,
energizing voltage means located on the boat for providing a square wave energizing voltage,
a plurality of switch means, each switch means being connected to a corresponding ancillary device, to a corresponding control pulse means and to either the control voltage means or to the energizing voltage means depending on the nature of the corresponding ancillary device for keeping the corresponding ancillary device on-line during the presence of a control pulse from the control pulse means or keeping the corresponding ancillary device

off-line during the absence of a control pulse from the control pulse means, and

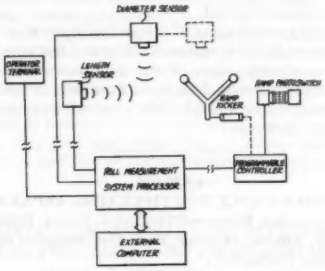
display means connected to the plurality of switch means for displaying information from those ancillary devices that provide data signals as the data signals are provided by the plurality of switch means, further comprising a module voltage means, located on the boat and connected to each control pulse means, for providing a second square wave voltage; and each control pulse means provides its own biasing voltages and logic common utilizing the second square wave voltage.

4,528,651

METHOD AND APPARATUS FOR MEASUREMENT OF LENGTH AND HEIGHT OF OBJECTS

Gregory K. Brock, Auburn, and Bruce R. Knowlen, Tacoma, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Feb. 4, 1983, Ser. No. 463,794
Int. Cl.³ G01S *15/88, 7/52*
U.S. Cl. 367—99 **20 Claims**



1. A method of measuring the length and height or diameter of a geometrically regular object randomly positioned from side to side on a moving conveyor system which comprises

a. orienting the object so that it is positioned with its longitudinal axis normal to the direction in which it is being conveyed;

b. conveying the object to a measuring station between opposed echo-ranging transducers located on each side of the conveyor system;

c. determining the length of the object and its transverse position on the conveyor system by differential echo-ranging;

d. sending at least the transverse position to a microprocessor;

e. advancing the object beneath a transverse array of diameter sensing echo-ranging transducers;

f. activating the transducer in the aray which is closest to the mid-length position of the object to measure the height or diameter by echo-ranging, said transducer being selected by the microprocessor on the basis of transverse position location; and

g. indicating the length and diameter of the object.

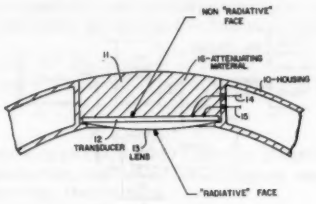
4,528,652

ULTRASONIC TRANSDUCER AND ATTENUATING MATERIAL FOR USE THEREIN

Michael S. Horner, Davis; Axel F. Brisken, Shingle Springs, and Claudio I. Zanelli, Fair Oaks, all of Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 30, 1981, Ser. No. 335,635
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—162 **5 Claims**

1. An ultrasonic transducer assembly having improved noise suppression characteristics comprising ultrasonic transducer means having a plurality of surfaces, a housing for receiving said transducer whereby one surface of said transducer is free to transmit and receive ultransonic waves, and a material positioned about said transducer and between said transducer and said housing for attenuating ultrasonic energy, said material comprising a heavily loaded resin based on an unfilled low



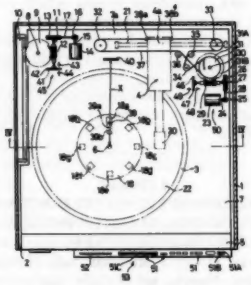
viscosity silicone rubber potting gel and a particle filler wherein the particle filler is lead oxide (Pb0) in the ratio of 1:1.5 to 1:6.0 whereby the material acoustic impedance is in the range of 2.1 to 3.3×10^6 rayls and the acoustic attenuation is in the range of 64 to 105 dB/MHz/cm.

4,528,653

RECORD PLAYER WITH AUTOMATIC MUSIC SEARCH FUNCTION

Hisashi Asano, Kunitachi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 588,928
Claims priority, application Japan, Mar. 19, 1983, 58-46874
Int. Cl.³ G11B *3/38, 7/00, 17/06*
U.S. Cl. 369—41 **11 Claims**



1. A record player of the type including a rotatable turntable, a tone arm carrying a pickup device for playing a record disk resting on said turntable and which has a plurality of radially spaced annular portions with information recorded thereon and intervening annular blank portions, and a tone arm actuating device to perform an automatic search function and to set down said pickup device on the record disk while it is rotating with said turntable, said record player further comprising:

first detecting means for detecting radial positions of said portions of a record disk resting on said turntable along a radial detection line at a predetermined initial angular position of said turntable;

second detecting means for detecting, as said record disk rotates, the angular positions of said detection line relative to said initial angular position; and

control means for controlling operation of said tone arm actuating device in response to the detected radial and angular positions such that said pickup device is set down

on the one of said blank portions immediately in advance of a selected one of said recorded portions of the record disk at an angular position on the record disk substantially corresponding to said detection line.

4,528,654

DUSTPROOF CASE FOR AN OPTICAL INFORMATION TAPE INCLUDING A CLAMPING LENS

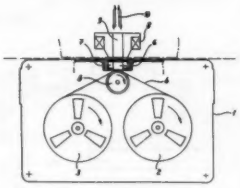
Joseph M. E. Beaujean, Venlo, Netherlands, assignor to Bogey B.V., Venlo, Netherlands

Filed Sep. 29, 1980, Ser. No. 192,043

Claims priority, application Netherlands, Oct. 1, 1979, 7907293

Int. Cl.³ G11B *7/12, 23/12*

U.S. Cl. 369—100 **2 Claims**



1. A dustproof case containg an optical information carrier tape wound on two reels between which an apparatus is provided for controlling the monoplanar motion of said optical information carrier tape by clamping between a first and second clamping means, wherein said first clamping means includes an optical lens and is connected to a feromagnetic piece, said second clamping means including a reflective surface means facing said tape, wherein an hour surface of said lens intermittently contacts said reflective surface means through said tape to control the motion of the tape therebetween, and wherein no internal electromagnetic field generating means are included in said case so that said first clamping means moves relative to the second means in respones to an external electromagnetic field to control movement of said optical information carrierd tape.

4,528,655

APPARATUS FOR DETECTING VARIATION OF ELECTROSTATIC CAPACITANCE

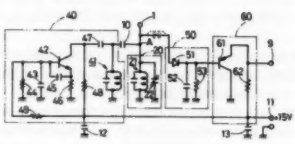
Sadahiro Tamura, Kyoto, and Toshio Nishikawa, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 9, 1982, Ser. No. 440,293

Claims priority, application Japan, Nov. 16, 1981, 56-185124; Dec. 8, 1981, 56-183028[U]

Int. Cl.³ G11B *9/06*

U.S. Cl. 369—126 **7 Claims**



1. An apparatus for detecting a variation of an electrostatic capacitance, comprising:

an oscillating circuit including a dielectric resonator for generating an oscillating output signal;

a resonance circuit including a dielectric resonator and responsive to variations of said electrostatic capacitance to amplitude modulate said output signal so that its amplitude varies in accordance with said variation in said electrostatic capacitance;

means for capacitively coupling said oscillating output signal to said resonance circuit; and

detecting means, directly coupled in terms of direct current, to said resonance circuit and responsive to said amplitude modulated output signal for generating a second output signal whose frequency varies in accordance with said variation of said electrostatic capacitance.

4,528,656

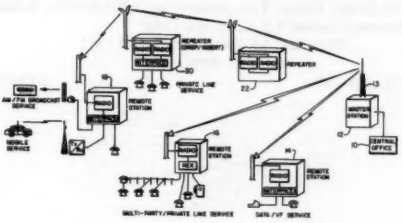
RADIO COMMUNICATION SYSTEM USING FREQUENCY DIVISION MULTIPLEXING FOR TRANSMISSION BETWEEN A MASTER STATION AND A PLURALITY OF REMOTE STATIONS

Douglas H. Morais, Dollard des Ormeaux, Canada, assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 2, 1982, Ser. No. 394,764

Int. Cl.³ H04L *5/14;* **H04J** *1/00;* **H04B** *7/00*

U.S. Cl. 370—30 **6 Claims**



1. In a system for effecting two-way radio transmission between a master station and a plurality of remote stations, each remote station comprising

baseband modulation means for modulating a signal channel to produce a baseband signal at a selected frequency;

a transmitter including first means for modulating said baseband signal on a carrier f_c whose frequency is uniquely assigned to the respective remote station and falls within a transmission band allocated to a first licensed frequency f_r and second means for transmitting said modulated baseband signal to the master station as a channel signal;

a receiver including third means for receiving from said master station a multiplexed multi-channel signal modulated on a second licensed frequency f_t and fourth means for downconverting said received signal to a nominal IF frequency;

demodulation means for demodulating said multi-channel IF frequency signal to a multi-channel baseband signal; and

demultiplexing means for locating a channel of information destined for the respective remote station in a specific section of the demodulated multi-channel baseband signal and for converting said channel located in the specific section of the baseband signal to a voice frequency channel;

said first means in said transmitter including a first local oscillator for effecting modulation of said baseband signal, and said fourth means in said receiver including a second local oscillator which is independent of said first local oscillator for downconverting said received signal.

4,528,657

FLUID SAMPLE CELL FOR X-RAY ANALYSIS

Patrick J. Meehan, Penfield, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

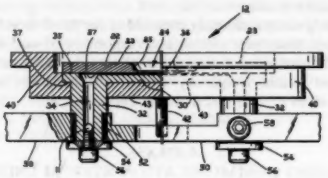
Filed Feb. 7, 1983, Ser. No. 464,422

Int. Cl.³ H01J *37/20;* **G01N** *23/22*

U.S. Cl. 378—47 **3 Claims**

1. A cell for the X-ray analysis of a liquid sample, said cell comprising: inflexible metallic back and face plates sandwiched in bearing engagement, said back plate having an inner

surface provided with a shallow cavity for a sample, said face plate having a planar inner surface and an outer surface pro-



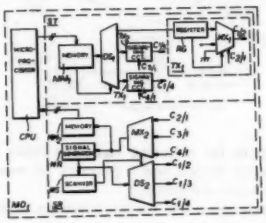
vided with a cavity presenting a thin layer of metal defining an aperture for X-rays.

4,528,658

TELECOMMUNICATION SYSTEM WITH A MULTIPLICITY OF MODULAR UNITS INTERCHANGING DIGITAL MESSAGES

John W. Israel, Dallas, Tex., assignor to Italtel-Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Sep. 13, 1982, Ser. No. 417,371
Int. Cl.[3] H04Q *3/00*
U.S. Cl. 370—58 **3 Claims**



1. In a telecommunication system, in combination, a multiplicity of message-exchanging modular units each comprising a transmitting section, a receiving section, and a microprocessor controlling the emission of a departing digital message by said transmitting section and handling arriving digital messages reaching said receiving section, the transmitting section of each modular unit being linked with the receiving section of each other modular unit of the system by a respective outgoing line, the receiving section of each modular unit being linked with the transmitting section of each other modular unit of the system by an incoming line constituting the outgoing line of such other modular unit, each of said lines including a signaling wire and a response wire;

the transmitting section of each modular unit comprising first memory means loadable by the associated microprocessor with departing messages including address bits designating the modular unit destined to receive the respective message, selection means connected to said first memory means for sending out a data-ready signal on the signaling wire of the outgoing wire leading to the designated modular unit, and switching means responsive to an acknowledgement signal on the response wire of the same line for replacing said data-ready signal by information bits stored in said first memory means as part of the message destined for the designated modular unit;

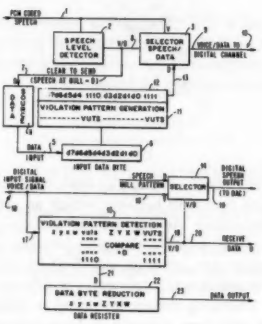
the receiving section of each modular unit comprising scanning means for continuously exploring the signaling wires of all incoming lines to detect the presence of a data-ready signal thereon, signal-generating means connectable by said scanning means to the response wire of each incoming line whose signaling wire is being explored to emit said acknowledgment signal thereover upon detection of said data-ready signal, with temporary halting of the exploration of said signaling wires by said scanning means in response thereto, and second memory means connectable by said scanning means to the momentarily explored signaling wire for temporarily storing information bits arriving thereover during the temporary halt of said exploration preparatorily to delivering said information bits to the associated microprocessor.

4,528,659

INTERLEAVED DIGITAL DATA AND VOICE COMMUNICATIONS SYSTEM APPARATUS AND METHOD

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,500
Int. Cl.[3] H04J *6/02*
U.S. Cl. 370—80 **11 Claims**



1. An interleaved digitized voice and data communications system, comprising:

a digitized data and voice transmitter and a digitized data and voice receiver, and a communications link connecting said transmitter and said receiver;

said transmitter comprising a voice input and a data input and means for detecting the momentary absence of voice signals, said detecting means being connected to said voice input;

controlling means responsive to the detection of momentary absence of voice signals by said detecting means and connected to said detecting means for controlling the admission of data signals from said data input into said transmitter and for connecting said voice or data signals, respectively, to said communications link;

a digital bit pattern generator means for generating a digital pattern code not used as a normal voice signal code;

encoding means connected to said digital bit pattern generator and to said data input for encoding a combined digital pattern code and data pattern having at least one scaling bit altered to a condition not used for voice transmission; and

means for supplying said encoded patterns to said controlling means, said controlling means applying said patterns to said communication link;

said digital data and voice receiver comprising a communications link input connection to said receiver and a digital speech output port and a digital data output port therefrom;

digital pattern code detecting means connected to said input and a selector means connected to said input;

said selector means being connected to said pattern detecting means and responsive to an indication therefrom that no said pattern code exists for applying the signals from said input connection to said digital speech output and responsive to an indication of the presence of a pattern code

therefrom for blocking any signal application to said digital speech output; and

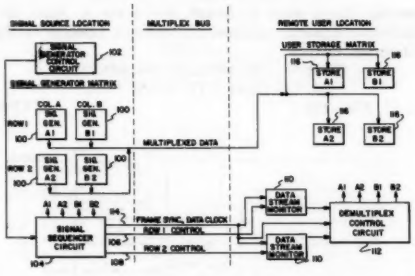
data byte decoder means connected to said pattern code detecting means and to said digital data output for removing said pattern code from said combined digital pattern code and data pattern and applying a digital data byte at said output for each combined digital data and encoded pattern input supplied thereto.

4,528,660

MULTIPLEXED DATA STREAM MONITOR

James F. Gentry, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,611
Int. Cl.³ H04J *6/02, 3/10*
U.S. Cl. 370—80 **7 Claims**



1. In a multiplex data system wherein output signals from a plurality of signal generators are sampled and multiplexed into repetitive frames of data onto a single channel for transmission to a remote user location, along with a synchronization signal and clock signals, a multiplexed data stream monitoring circuit comprising:

memory means for storing a single frame of data as it is received at said user location;

control means for accessing said memory means in synchronism with said multiplexed data stream, said control means comprising a counter circuit which counts said clock signals and is cleared by said synchronization signal, said memory means being addressed by the accumulated counts in said counter circuit which counts correspond to signals within said multiplexed data stream, such that a defined storage location corresponding to a given signal generator is addressed during the receipt of that portion of the multiplexed data stream corresponding to the output signal of said given signal generator, each of said storage locations being initially read and then written; and

gating means responsive to the current multiplexed data stream and the signals read from said memory means corresponding to the immediately preceding state of said multiplexed data stream for generating a signal representative of the status of said multiplexed data stream, the gating means being selected to identify characteristics of signals within said multiplexed data stream.

4,528,661

RING COMMUNICATIONS SYSTEM

Richard G. Bahr, Framingham, and Thomas C. Hogan, Natick, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

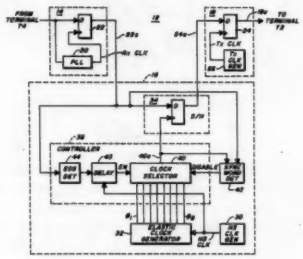
Filed Feb. 14, 1983, Ser. No. 466,110
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—86 **3 Claims**

1. A ring communications network comprising a plurality of terminals coupled together to provide a unidirectional communications ring, each of said terminals including an input port and an output port,

Wherein each terminal has its input port coupled to the output port of the next upstream terminal and has its output port coupled to the input port of the next downstream terminal, and wherein each terminal includes:

A. means for receiving a digital signal at said input port at the data rate associated with the next upstream terminal, said received digital signal including a succession of receive data packets interleaved with an associated succession of receive synchronization packets, said data packets having a number of bits less than or equal to a predetermined limit, and said synchronization packets having a number of bits between predetermined maximum and minimum limits,

B. means for detecting each receive synchronization packet and its associated receive data packet,



C. means responsive to said detecting means for generating a succession of transmit synchronization packets and associated transmit data packets at a predetermined fixed transmit data rate associated with said terminal, wherein the data bits of each transmit data packet match bit for bit the data bits of the corresponding receive data packet and wherein the number of bits in the transmit synchronization packet is the same or different from the number of bits in the associated receive synchronization packet whereby the data rate for each transmit data packet and its associated transmit synchronization packet corresponds to said transmit data rate associated with said terminal, and

D. means for transmitting said succession of transmit synchronization packets and associated transmit data packets from said output port at said transmit data rate associated with said terminal.

4,528,662

MULTIPLEX CONTROL SYSTEM HAVING ENHANCED INTEGRITY

William M. Floyd, Livonia; Nathaniel Webb, Detroit, and David L. Juzswik, Dearborn Heights, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 7, 1983, Ser. No. 540,581
Int. Cl.³ H04J *3/16, 3/00*
U.S. Cl. 370—92 **14 Claims**

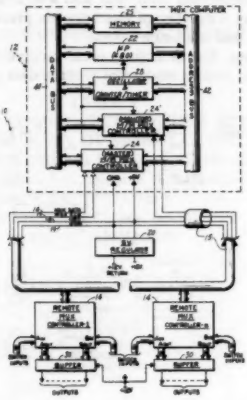
1. A serial data communications system for providing bidirectional serial data communication between a central control station and one or more remote stations, comprising:

central station control means including a central controller and at least two multiplex controllers;

serial signal bus means having terminals at two opposite ends, said serial bus means being arranged as a loop having one said end terminal connected to one of said multiplex controllers and having the other said end terminal connected to the other of said multiplex controllers;

a remote multiplex controller at each of said remote stations, each said remote multiplex controller including input/output (I/O) signal ports for input and output respectively of

signals respectively from and to remote input devices and remote load devices, each said remote controller being parallel "T" connected to said serial bus means intermediate said end terminals thereof and having a respective address and being responsive to a serial communication containing said respective address, from said central control station for providing a response to said communication, a said response including input of signals from said remote input devices or output of signals to said remote load devices and a data reply to said serial bus means via said connection therewith; and



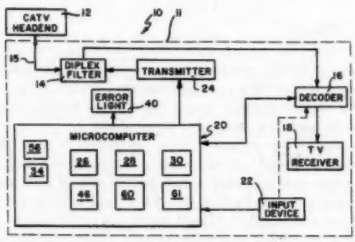
said central controller being operatively connected for communication with each of said multiplex controllers, each of said multiplex controllers being selectably responsive to instruction by the central controller for effecting serial bidirectional data communication transactions as a master with addressed ones of said remote controllers, said central controller including signal processing means for selecting one of said multiplex controllers to be said master in accordance with a preselected bias and for selecting the other of said multiplex controllers to be said master when data communication of acceptable integrity with an addressed one of said remote controllers by said one multiplex controller is unattainable.

4,528,663

PEAK LOAD ACCESS IN A TWO-WAY CATV CONTENTION SYSTEM

Richard W. Citta, Oak Park, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 9, 1983, Ser. No. 560,087
Int. Cl.[3] H04J *3/00;* **H04H** *1/00*
U.S. Cl. 370—94 **16 Claims**



1. In a two-way contention communications system wherein a data message is successively transmitted from a subscriber terminal to a central facility until the data message is successfully received by the central facility, each data message transmission occurring at a random time within a respective time interval, the improvement comprising the steps of:

increasing the length of said time interval in response to each successive transmission of said data message until a time interval of a predetermined maximum length is achieved corresponding to a predetermined number of successive transmissions of said data message; and

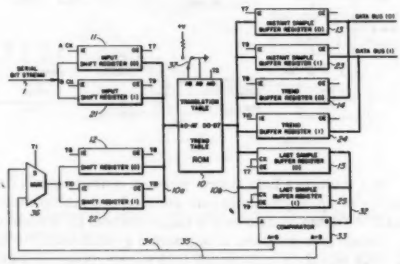
decreasing the length of said time interval in response to each of a selected number of succesive transmission of said data message following said predetermined number of successive transmissions.

4,528,664

CALL PROGRESS SIGNAL MONITOR AND METHOD FOR TELEPHONE SYSTEMS

Chao-Jan Cheng; John R. Donak, and Samir E. Ahad, all of Belleville, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 29, 1982, Ser. No. 445,246
Int. Cl.[3] H04J *3/12;* **H04M** *19/02*
U.S. Cl. 370—110.3 **7 Claims**



1. A call progress signal monitor which includes a translation circuit for generating data signals indicative of predetermined characteristics in a bit stream of plural bit encoded positive and negative sign samples, and a detection circuit being responsive to the data signals for detecting call progress tones, and silence, the call progress monitor being characterized in that the translation circuit comprises:

a translation means for translating an instant occurring sample into an instant data word having a code value with reference to a maximum possible value of the sample;

a comparing means for generating a comparison value signal in response to code values of the instant data word and an immediately previous data word; and

encoding means for generating a trend code in response to an instant comparison value signal and a plurality of consecutive previous comparison value signals;

each of the data signals being comprised of said instant data word and a corresponding instant trend code.

4,528,665

GRAY CODE COUNTER WITH ERROR DETECTOR IN A MEMORY SYSTEM

Gary D. Burns, Cottage Grove; Donald W. Mackenthun, Fridley, and Scott D. Sckaber, St. Paul, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed May 4, 1983, Ser. No. 491,464
Int. Cl.[3] G06F *11/10*
U.S. Cl. 371—51 **14 Claims**

6. An improved dynamic memory system in combination comprising:

a plurality of dynamic memory units, each including dy-

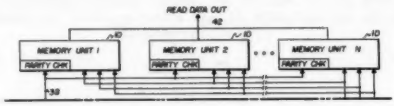
namic memory cells arranged in rows and columns, and having associated circuitry for accessing addressed ones of said cells and further including address parity checking circuitry;

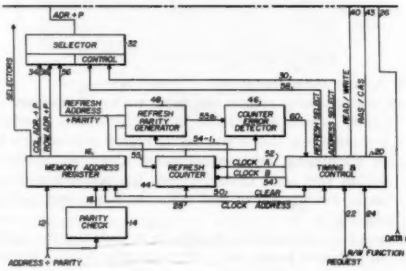
timing and control means for receiving memory system access request signals and for providing first control signals for controlling access to said plurality of memory units and for providing second control signals for controlling refreshing of said plurality of memory units;

memory address register means for receiving memory addresses to be accessed, said memory addresses including parity signals associated therewith;

refresh counter means responsively coupled to said timing and control means for generating refresh addresses in response to said second control signals;

refresh parity generator means responsively coupled to said timing and control means for generating parity signals





accociated with said refresh addresses generated by said refresh counter means;

counter error detector means responsively coupled to said refresh counter means and said refresh parity generator means for detecting errors in operation of said refresh counter means and providing error indicating signals indicative of detected errors;

selector means coupled to said memory address register means, said refresh counter means, said refresh parity generator means, and said timing and control means for selecting said memory addresses and said parity signals associated therewith in reponse to said first control signals and for selecting the said refresh addresses and said parity signals associated with said refresh addresses in response to said second control signals, said selector means including means for applying the selected addressing signals with associated parity signals to said plurality of memory units.

4,528,666

MEMORY SYSTEM WITH BUILT IN PARITY

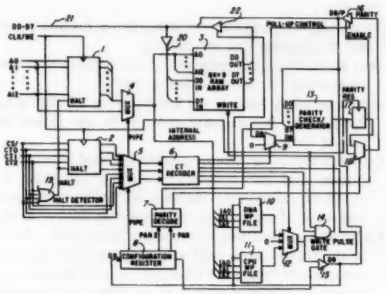
James H. Cline, Allen, and David M. Chastain, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1983, Ser. No. 455,181
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **7 Claims**

1. A memory apparatus comprising:

an array of storage elements connected to a plurality of addressing lines for selectively connecting a group of the storage elements to a plurality of data lines;

user programmable control circuit means for generating a first signal when a selected storage element within the selected group is selected to contain parity information, and for generating a second signal when the selected storage element within the selected group is selected to contain data information;



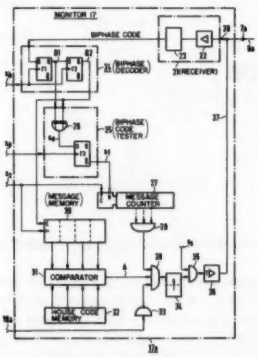
parity circuit means connected to the data lines and the selected storage elements group for generating parity to designate validity of data within the selected group contained in the portion of storage elements selected by the address lines and storing the parity in the array with the data group when the first signal is generated.

4,528,667

SYSTEM FOR THE TRANSMISSION OF INFORMATION MESSAGES

Waldemar Frühauf, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 485,620
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215081
Int. Cl.³ G08C *25/00*; G06F *11/00*
U.S. Cl. 371—55 **19 Claims**



1. In a house system for the transmission of information messages which are encoded in the form of digital signals, wherein a house code specific to the house system is selected adapted for the testing of each information bit, including a central station and a series of substations at which the information messages of the central stations are selectively transmittable through the electrical power supply as a transmission path which is utilized by further similar systems, wherein each

substation terminates further information evaluation on the basis of an information bit recognized as erroneous, and wherein each information message includes a selectable subsequence of digital signals specific to the house system occurring at other than the end of the total sequence of digital signals representing the information message, the improvement comprising:

(a) said central station emitting an electrical operating signal during the duration of each information message emitted thereby;

(b) a monitoring unit for receiving the operation signal;

(c) said monitoring unit containing

(aa) a receiving component for the information message connected to the transmission path;

(bb) a memory having the subsequence of digital signals having the house code specific to the house system stored therein;

(cc) a comparator means, coupled to said receiving component and said memory, within which there is analyzed the information message for the occurrence of the sequence of digital signals specific to the house system;

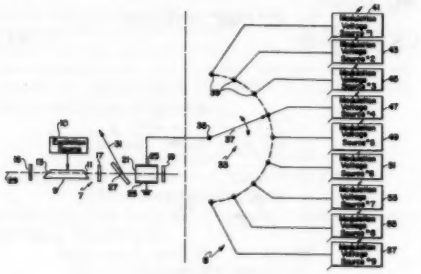
(dd) and a transmitting component connected at its output to the transmission path and coupled at its input to said comparator means for emitting a signal on the transmission path effectuating a code alteration in the information message when in an incoming information message on the transmission path there occurs a subsequence of digital signals specific to the house system without the concurrent presence of the operation signal emitted by said central station.

4,528,668

PROGRAMMABLE MULTIFUNCTION LASER

Robert J. Wayne, Berlin; Robert W. Henschke, E. Hampton, both of Conn., and Robert J. Mongeon, E. Longmeadow, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,458
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—26 **6 Claims**



1. A programmable multi-format modulated laser, comprising:

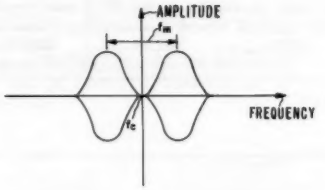
a main resonant cavity including a gain cell positioned along an optical axis, a source of excitation coupled to said cell, a gaseous lasing medium within said gain cell and a pair of windows at opposite ends, said gain cell constrained to emit only linearly polarized optical flux along one direction, intracavity modulation coupling means axially aligned with said main cavity including a birefringent crystal modulator with electrodes thereon for application thereto of modulation voltages and a polarization coupler set at the Brewster angle to the optical axis to couple out of said laser optical flux polarized orthogonally to that emitted by said gain cell, a plurality of mirrors including first and second highly reflective mirrors positioned at respective opposite ends of said main cavity and intracavity coupling means and a third low reflectivity mirror between said main resonant cavity and intracavity means, and a programmable modulation voltage source means connected to said modulator electrodes, said voltage source means including a plurality of sources of different modulation voltage waveforms, and switching means for selectively applying one of said plurality of sources to said modulator crystal for a predetermined time interval.

4,528,669

COMBINED AM/FM LASER RADAR TRANSMITTER

Hoyt A. Bostick, Newport Beach, and Carl J. Buczek, Encinitas, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 15, 1983, Ser. No. 561,766
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—26 **10 Claims**



1. A laser radar transmitter comprising:

an active lasing region disposed within a resonant laser cavity which is enclosed in an electrically conductive laser housing, said active lasing region producing a beam of circulating coherent radiation along an optical axis within said laser cavity; means for continuous simultaneous modulation of said coherent beam, said means including: a

means for continuously amplitude modulating the circulating coherent beam, said AM means aligned with the active lasing region along the optical axis; and a

means for continuously frequency modulating the circulating coherent beam, said FM means aligned with the active lasing region along the optical axis; and

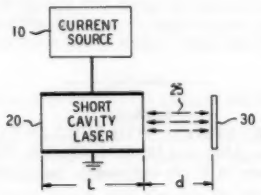
means for removing said continuously simultaneously modulated coherent radiation from said laser cavity.

4,528,670

SHORT COUPLED CAVITY LASER

Charles A. Burrus, Jr., Fair Haven, and Chinlon Lin, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 25, 1983, Ser. No. 469,813
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—44 **11 Claims**



1. In combination, a short cavity semiconductor laser having first and second substantially parallel facets for generating coherent light quanta in response to an applied signal, the light quanta exiting at least the first facet of the laser, and

a reflective surface spaced apart from and in predetermined relationship with the first facet of the laser, so that the reflective surface and the first facet form an external cavity resonator therebetween, the short cavity semiconductor laser and the external cavity resonator have a combined length less than about 200 microns.

4,528,671

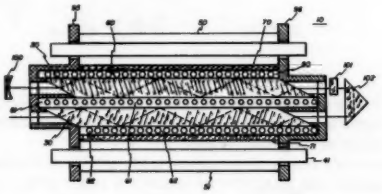
MULTIPLE HOST FACE-PUMPED LASER

Alexander G. Robbins, Vestal, N.Y., assignor to General Electric Company, Burlington, Vt.

Continuation-in-part of Ser. No. 317,134, Nov. 2, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 602,841

Int. Cl.³ H01S *3/14*

U.S. Cl. 372—68 **9 Claims**



1. A multiple host face pumped laser with total internal reflection, comprising:

an enclosure;

two elongated homogeneous bodies of an active host disposed in said enclosure, said laser host bodies each having a respective longitudinal axis and two optically plane faces extending substantially parallel to each other and to said longitudinal axis, said laser host bodies being arranged in a mutually spaced apart relationship such that their respective optically plane faces and longitudinal axes are generally parallel;

pumping means for providing electromagnetic radiation to impinge upon one of said optically plane faces of one of said laser host bodies to enter said one laser host body, at least a portion of said radiation passing through said one laser host body to exit therefrom and thence to impinge upon one of the optically plane faces of the second of said laser host bodies to enter said second laser host body, thereby to excite atoms of both of said laser host bodies to a metastable state to produce a population inversion therein;

means coupled by electromagentic radiation to form, with said one laser host body, a laser resonant cavity whereby said population inversion in conjunction with said resonant cavity means generates an output lasing radiation which, by total internal reflections from said optically plane faces, progresses along the respective longitudinal axis of said one laser host body and exits one end of said laser host body; and

means for passing a liquid coolant across said optically plane faces of said laser host bodies for extracting heat generated within the laser bodies including means to restrict and passively regulate the flow of coolant separately to each of said optically plane faces to provide a rate of coolant flow to each of said optically plane faces in proportion to its respective rate of heating to cool all of said faces to approximtely the same temperature.

4,528,672

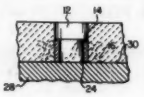
WELD INSERT AND REFRACTORY ANCHOR

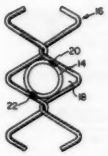
John W. Morgan, II, Upper St. Clair, and Thomas E. Klein, Library, both of Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Feb. 16, 1984, Ser. No. 580,658

Int. Cl.³ F27D *1/04*

U.S. Cl. 373—75 **9 Claims**





1. A protective refractory member for protecting a heat-absorptive element in a high-temperature furnace comprising a refractory shape, an interconnected reticulated metal mesh embedded within the shape positioned substantially adjacent an inner surface of the shape, at least one opening extending through a thickness of said shape and through said mesh to form a clear-through, uninterrupted passageway, a tubular insert located within the passageway and extending to said inner surface, said insert being welded to said reticulated metal mesh, said member adapted for attachment to an element by engaging said inner surface to an element and welding said insert thereto.

4,528,673

LADLE FURNACE WITH DC HEATING

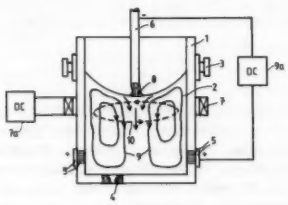
Sven-Einar Stenkvist, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 8, 1983, Ser. No. 530,242

Claims priority, application Sweden, Sep. 9, 1982, 8205134

Int. Cl.³ H05B *7/20*

U.S. Cl. 373—108 **2 Claims**



1. A ladle furnace comprising a ladle containing a melt of molten metal up to a level at or above half the ladle's height, an arcing electrode positioned substantially on the ladle's vertical axis so as to form a heating arc with said melt in the ladle, a melt electrode positioned in the ladle's lower portion substantially symmetrically with respect to the arcing electrode, means for supplying the arcing and melt electrodes with DC power so as to cause a symmetrical flow of current vertically through said melt and between the arc and the melt electrode, a coil surrounding the ladle and positioned at or above half the ladle's height and below said level, and means for supplying

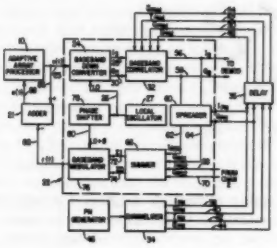
the coil with DC power, said coil when powered by said means projecting a field through the melt horizontally with respect to said vertical flow of current so as to intersect said flow and cause said melt to rotate.

4,528,674

METHOD AND APPARATUS FOR BASEBAND GENERATION OF A SPREAD SPECTRUM REFERENCE SIGNAL FOR USE IN AN LMS ADAPTIVE ARRAY PROCESSOR

Dennis A. Sweeney, and David E. Sanders, both of St. Petersburg, Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Aug. 22, 1983, Ser. No. 525,295
Int. Cl.³ H04B *1/10, 15/00*
U.S. Cl. 375—1 **16 Claims**



10. A method for baseband generation of a reference signal for use with an LMS adaptive array processor in a spread spectrum communication system, the processor providing an IF summed, weighted spread spectrum signal, comprising the steps of:

translating said IF spread spectrum signal to baseband to produce an I (in-phase) channel baseband signal and a Q (quadrature-phase) channel baseband signal, said spread spectrum signal utilizing a pseudonoise (PN) code sequence,

correlating said I channel and Q channel baseband signals with in-phase and quadrature-phase PN signals to produce despread I channel and Q channel baseband output signals,

spreading said despread I channel and Q channel baseband output signals with said in-phase and said quadrature-phase PN signals to produce respread I channel and Q channel baseband signals, and

modulating said respread I channel and Q channel baseband signals with a phase-shifted local oscillator to produce said reference signal.

4,528,675

FSK MODEM FOR BIDIRECTIONAL LOOP COMMUNICATIONS SYSTEM

Robert J. Esterling, Horsham; Clarence L. Freed, Harleysville; Edward L. Weiss, Milford Township, Pike County all of Pa., and Simon Korowitz, Sharon, Mass., assignors to General Signal Corporation, Stamford, Conn.

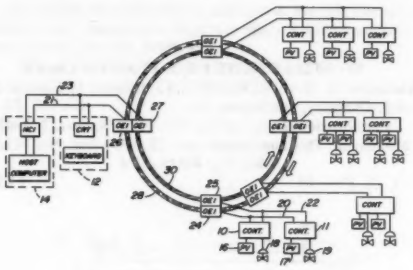
Filed Aug. 31, 1983, Ser. No. 528,357
Int. Cl.³ H03C *3/00;* **H03D** *3/00;* **H04B** *1/38*
U.S. Cl. 375—9 **5 Claims**

3. In a communications system having bidirectional loops making up redundant global data highways with corresponding redundant local highways connecting each of a plurality of stations thereto at nodes of the global highways, a modem providing an interface between a data bus of each station and said highways, comprising:

a transmitter operative to simultaneously transmit data from said station data buses to both of said highways in the form of frequency-shift-keyed signals coded to provide a prefix consisting of a predetermined number of pulses of a frequency which is a multiple or submultiple of a predetermined baseband frequency followed by a synch period of one bit time with no pulses which is in turn followed by data which in one state is at the baseband frequency and in the other state is at another frequency with the data being followed by a suffix having a fixed number of bit times without a valid data signal; and

a separate receiver for each of said redundant highways, each of said receivers including;

a prefix counter operative to count said received signals



during said initial period and to produce a carrier-detect signal indicative of receipt of a predetermined number of pulses at the prefix frequency,

a synch-detecting circuit connected to receive said incoming signals and operative to produce a synch-detect signal when detecting a bit time without a valid data bit in the received signal,

a first-carrier-selection circuit operative in response to both a carrier-detect signal and a corresponding synch-detect signal to cause a selection of the corresponding receiver as the one from which data is passed to the station data bus.

4,528,676

ECHO CANCELLATION CIRCUIT USING STORED, DERIVED ERROR MAP

Gordon F. Mein, Ottawa; John B. Terry, Carp, and Gregory F. Hicks, Smiths Falls, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 14, 1982, Ser. No. 387,944
Int. Cl.³ H04B *3/08*
U.S. Cl. 375—14 **5 Claims**

1. A method for reducing errors in information recovery from an encoded signal stream being received from a transmission medium and including transitions between more than two logic levels and thus including various types of corresponding transitions, the method comprising the steps of:

predetermining storage facility for the subsequent separate storing of a delayed component corresponding to each of the various types of transitions;

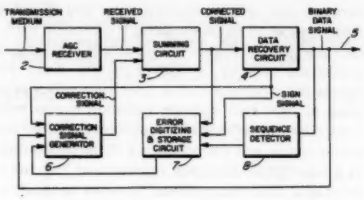
detecting the particular type of transition occurrence in the received encoded signal stream;

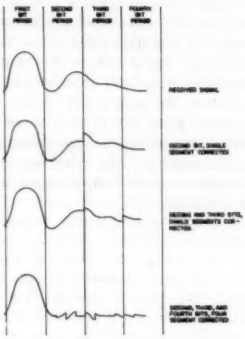
detecting a delayed component of a transition in the signal stream;

subsequently storing a digital representation of the detected delayed component at the predetermined corresponding storage facility and;

in response to each subsequent occurrence of the transition in the signal stream, generating an analog cancellation signal defined by a reading of the stored digital representation from the corresponding storage facility and adding

the analog cancellation signal to the encoded signal stream as it is being received, to reduce distortion effects of de-





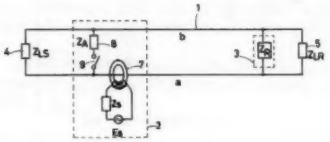
layed components of said subsequent occurrences of the transition in the received signal stream.

4,528,677

DATA TRANSMISSION SYSTEM

Masahiro Ise, Kashihara; Hidehiko Tanaka, Tenri, and Katsuyuki Machino, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1983, Ser. No. 501,252
Claims priority, application Japan, Jun. 9, 1982, 57-99914
Int. Cl.³ H04B *3/02*
U.S. Cl. 375—36 **11 Claims**



1. A data transmission system including a pair of parallel transmission lines comprising:

(a) data signal source means for generating a data signal current at a predetermined transmission frequency;

(b) magnetic coupling means for applying said signal current to one of said transmission lines at a predetermined location thereon; and

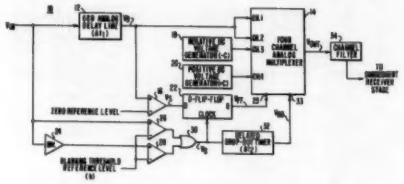
(c) impedance means connected between said pair of transmission lines adjacent to said coupling means for applying said signal current to the other of said transmission lines, said impedance means exhibiting a low impedance at said transmission frequency.

4,528,678

NONLINEAR NOISE REDUCTION APPARATUS WITH MEMORY

Eric A. Udren, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1983, Ser. No. 510,784
Int. Cl.³ H04B *1/10*
U.S. Cl. 375—104 **68 Claims**



1. A memory nonlinear noise-blanking circuit responsive to a composite signal including an information signal distorted by a noise signal, said memory nonlinear noise blanking circuit comprising:

delay means responsive to the composite signal for producing a delayed signal;

means for producing a first reference signal;

threshold detector means including:

first comparator means having an inverting input terminal responsive to the first reference signal and a non-inverting input terminal responsive to the composite signal, for producing a first comparison signal;

inverter means responsive to the composite signal for producing an inverted signal;

second comparator means having an inverting input terminal responsive to the first reference signal and a non-inverting input terminal responsive to the inverted signal, for producing a second comparison signal;

and first gate means having a first input terminal responsive to said first comparison signal and a second input terminal responsive to said second comparison signal, for producing a threshold signal at an output terminal thereof, said threshold signal rendered in a first state in response to one set of conditions of said first and second comparison signals and in a second state in response to another set of conditions of said first and second comparison signals;

timer means responsive to said threshold signal for producing a timing signal, wherein said timing signal is in a first state when said threshold signal is in said first state, and wherein said timing signal changes to a second state a predetermined time after said threshold signal changes to said second state;

signal generator means for producing an approximation signal selected to approximate the value of the information signal while said timer means is in said first state;

and second gate means responsive to said delayed, timing, and approximation signals for producing an output signal at an output terminal thereof, wherein said output signal represents said approximation signal when said timing signal is in said first state, and represents said delayed signal when said timing signal is in said second state.

4,528,679

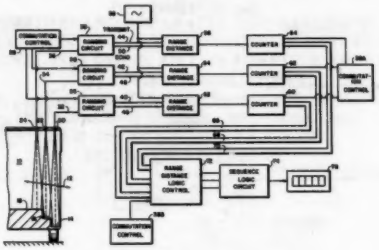
AUTOMATIC COUNTING SYSTEM FOR PASSAGES

Zalmai S. Shahbaz, and Klaus H. Frielinghaus, both of Rochester, N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 14, 1983, Ser. No. 474,870
Int. Cl.³ G06M *1/27;* **G01S** *9/66*
U.S. Cl. 377—6 **27 Claims**

1. An automatic counting system for non-uniform bodies having a non-uniform speeds in either direction through a constricted passage comprising a ranging apparatus having at

least three ranging stations spaced longitudinally along the passage for detecting the presence and absence of bodies to be counted at said stations, and a sequence logic circuit connected to said ranging apparatus for detecting and interpreting the sequence in which bodies are detected at said ranging stations



for thereby counting the passage of bodies said ranging stations all including means operable to determine the distance to a detected body for detecting the presence of that body by emitting a pulse of energy oscillations within a limited wavelength spectrum and for measuring the time interval until that energy is reflected back from a detected body to be counted.

4,528,680

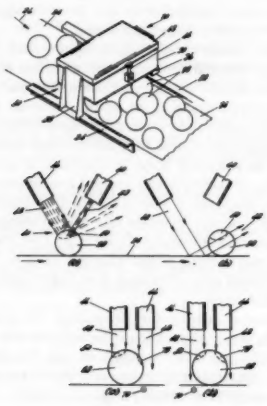
APPARATUS FOR COUNTING ARTICLES TRAVELING IN A RANDOM PATTERN

William J. Archambeault, P.O. Box 508, Goleta, Calif. 93116

Filed Aug. 4, 1983, Ser. No. 520,510

Int. Cl.[3] **G06M** *7/00*

U.S. Cl. 377—6 **21 Claims**



1. Apparatus for counting articles traveling in a random pattern along a predetermined path in a selected direction comprising

means positioned along said predetermined path for defining an article counting stage which is adapted to have passed therethrough articles to be counted which are traveling in a random pattern along said predetermined path in a selected direction;

means positioned relative to said article counting stage for producing in a scan pattern thereacross a plurality of pulsed, spaced parallel beams of radiation such that each article is adapted to have at least two selected portions thereof independently intercept at least two beams of radiation and to reflect therefrom at least two pulses of radiation along different reflection paths, each of said radiation beams being directed along a scan path into said article counting stage and each of which is adapted to be intercepted by a selected portion of said article passing through said article counting stage and to reflect therefrom a pulse of radiation along a reflection path;

means positioned relative to said article counting stage and positioned relative to said radiation beam producing means for receiving said at least two pulses of radiation from at least two separate radiation beams being intercepted by and reflected from different selected portions of a said article and for producing therefrom output signals in a time spatial sequence representing that the radiation level of at least two received pulses of radiation exceeded a threshold level and with the time spatial sequence therebetween commencing with the first received radiation pulse output signal; and

logic means operatively coupled to said radiation receiving means for receiving said output signals and responding to the first received radiation pulse output signal to produce and pass a count signal and, to inhibit passing of count signals produced from later received radiation pulse output signals from the same article unless a later received radiation output pulse is of at least one of a greater amplitude and duration whereupon the count signal produced therefrom is passed and the count signals from the first received radiation pulse output signal and other count pulses are inhibited.

4,528,681

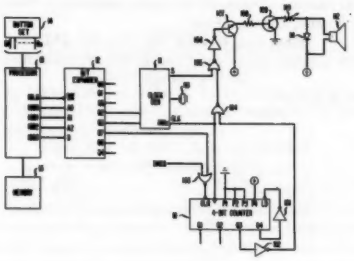
BUTTON DEPRESSION CLICK GENERATOR

Emanuel J. Fulcomer, Jr., Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1982, Ser. No. 454,265

Int. Cl.[3] **H03K** *21/32;* **H04M** *11/00;* **G04F** *3/06*

U.S. Cl. 377—16 **12 Claims**



7. A circuit for generating a selectable length output signal in response to a single input signal, said circuit comprising

an input for receiving periodic signals,

means for counting said periodic signals,

means for holding said counting means at a first peset number of counts without regard to the continuation of said periodic signals,

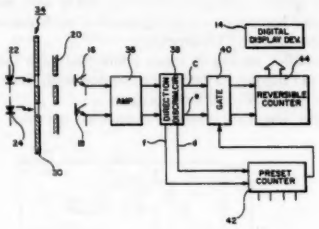
means controlled by said single input signal for enabling said counter to advance from a second preset number to said first preset number under control of received periodic signals, and

means controlled by said advancing counter and operable in conjunction with said periodic signals for providing said output signal.

4,528,682
DIGITAL MEASURING INSTRUMENTS

Tooru Nakaoki, Tokyo, Japan, assignor to Mutoh Industry Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,482
Claims priority, application Japan, Mar. 14, 1980, 55-32465; Mar. 22, 1980, 55-36629; Mar. 22, 1980, 55-36630
Int. Cl.³ G06M 3/14
U.S. Cl. 377—24 3 Claims



1. In a digital measuring instrument wherein a distance of a transfer unit that moves due to the rotation of a feed shaft of a machine is digitally measured, the improvement comprising: a casing; an encoder which is self-contained within said casing and which converts a rotary motion of said feed shaft into output pulse signals having a directional component; a direction discriminating circuit which is connected to said encoder for determining said directional component of said output pulse signals of said encoder; a reversible counter which is connected to said direction discriminating circuit through counter input gate circuit, said counter input gate circuit being provided between an input terminal of said reversible counter and an output terminal of said encoder; and a counter input gate automatic control means which comprises a storage means for storing a play of the feed shaft of the machine and said storage means is connected to an output of said direction discriminating circuit for incrementing or decrementing the stored play, wherein the disabling and enabling of said counter input gate circuit is determined based on the content of the play stored in said storage means and wherein said reversible counter counts said output pulses from said encoder.

4,528,683
CIRCUIT FOR STORING A MULTI-DIGIT DECIMAL NUMERICAL VALUE OF THE DISTANCE TRAVERSED BY A VEHICLE

Peter Henry, Mühlheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 381,674
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123654
Int. Cl.³ G01B 7/02
U.S. Cl. 377—24 8 Claims

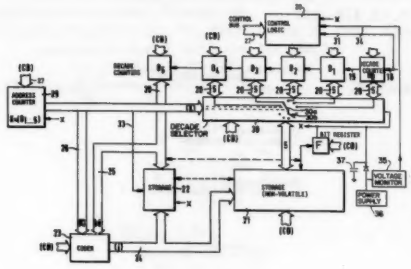
1. In a circuit for storing a multi-digit decimal numerical value of the distance traversed by a vehicle having a signal transmitter which gives off electric counting pulses, and particularly an electronic tachometer, particularly adapted for use with an odometer, the improvement wherein said circuit further comprises

an electronic encoder coding the numerical value in a one-step code whereby the numerical value can be stored; and wherein

said encoder includes decade counters in which each decade of a counter for the counting of the numerical value is adapted for use with the one-step code; said circuit further comprising

means for transferring the numerical value coded in the one-step code from said counter to a non-volatile storage formed of floating gate storage cells each having an input; and

wherein one group each of floating gate storage cells can be addressed for the storage of one-step coded numerical values corresponding to each decade, and wherein

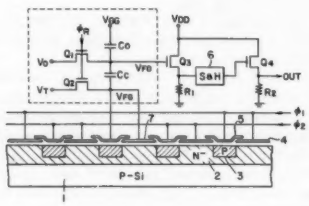


said means for transferring the numerical value include means which are actuated at predetermined numeral values for cyclically interchanging the addresses of the storage places of the lowest of said decades.

4,528,684
CHARGE-COUPLED DEVICE OUTPUT CIRCUIT

Tetsuya Iida, and Tatsuo Sakaue, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 22, 1983, Ser. No. 516,457
Claims priority, application Japan, Jul. 23, 1982, 57-128644
Int. Cl.³ G11C 19/28, 27/00
U.S. Cl. 377—60 4 Claims



1. A charge-coupled device output circuit for detecting an output signal from an amount of charges accumulated below a floating gate electrode; in which said floating gate electrode is connected in series to a first potential level (V_{GG}) point through first and second capacitors, a first connecting point of said floating gate electrode and said first capacitor is connected to a second potential level (V_T) point through a first control switch which is driven by a first reset clock pulse (ϕ_{R1}), and a second connecting point of said first and second capacitors is connected to a third potential level (V_O) point through a second control switch which is driven by a second reset clock pulse (ϕ_{R2}), to detect said output signal at said second connecting point.

4,528,685

X-RAY BEAM FILTER DEVICE

Howard H. Kump, Elm Grove, and William F. Collins, Waukesha, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed May 16, 1983, Ser. No. 494,974

Int. Cl.³ G21K *3/00*; G02B *5/22*

U.S. Cl. 378—157 **10 Claims**

1. A filter device for being interposed in an X-ray beam projected from an X-ray source, the device comprising:

a base member,

a first generally planar filter element and a second generally planar filter element adjacent the first element and substantially coplanar therewith, said first and second elements being joined to form a unitary member mounted for travelling between limit positions relative to the base member in one plane that is transverse to the path of the central ray of the X-ray beam,

a third planar filter element mounted for travelling relative to said base member in a second plane parallel to said one plane,

means on said unitary member and third filter element cooperating to cause said member to pull said third filter element into the beam path when said member is driven toward and to one limit of its travel and to push said third element out of the beam when said member is driven toward and to the other limit of its travel, and

reversible motor means and means operatively coupling said motor means to said member comprised of said first and second filter elements for said motor means to drive said member selectively in opposite directions to obtain a plurality of filtering modes,

in one of said modes, driving the unitary member to said one limit position causing said third element to be pulled into the beam,

in another of said modes, driving the unitary member to the other of said limit positions to push said third element out of the beam path to permit said member to be oscillated under the influence of said motor to position said first and second filter elements alternately in the beam path, and

in another mode wherein said member is first moved to said one limit to pull said third filter element into the beam path and then said member is oscillated to position the first filter element in the beam path with the third element and alternately to let only the third filter element remain in the beam path.

4,528,686

FADER CIRCUIT FOR VEHICLE SOUND SYSTEM

Roger W. Dressler, Pleasant Hills, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1983, Ser. No. 566,939

Int. Cl.³ H03G *3/00*

U.S. Cl. 381—28 **12 Claims**

1. A two-channel audio amplifier for use with a multi-speaker stereophonic sound reproduction system of the type in which each audio channel includes first and second two-terminal loudspeakers, each channel of said audio amplifier comprising:

a first source of low-level audio signals, said first source providing low-level audio signals of one phase;

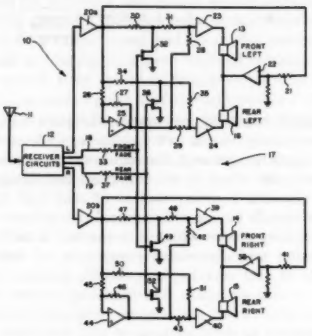
a second source of low-level audio signals, said second source providing low-level audio signals of phase opposite to the phase of said signals provided by said first source;

a first amplifier having its input connected with said first source and having its output commonly connected to one terminal of each of the first and second loudspeakers;

a second amplifier having its input connected with said second source and having its output connected with the remaining terminal of the first loudspeaker;

a third amplifier having its input connected with said second source and having its output connected with the remaining terminal of the second loudspeaker;

first variable impedance means connected between said first



source and said input of said second amplifier for coupling said signals from said first source to said input of said second amplifier, the impedance of said first variable impedance means being continuously variable in response to application of a first control signal, the degree of said coupling thereby being controllable by said first control signal;

second variable impedance means connected between said first source and said input of said third amplifier, for coupling said signals from said first source to said input, the impedance of said second variable impedance means being continuously variable in response to application of a second control signal, the degree of said coupling thereby being controllable by said second control signal, whereby application of said first and second control signals regulates the magnitude of signals from said first source applied to said inputs of said second and third amplifiers thereby altering the audio output level of the first and second loudspeakers connected thereto.

4,528,687

SPOKEN-INSTRUCTION CONTROLLED SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazunori Noso, Yokosuka; Norimasa Kishi, Yokohama, and Toru Futami, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 30, 1982, Ser. No. 432,379

Claims priority, application Japan, Oct. 22, 1981, 56-169172; Oct. 22, 1981, 56-169173

Int. Cl.³ G10L *1/00*

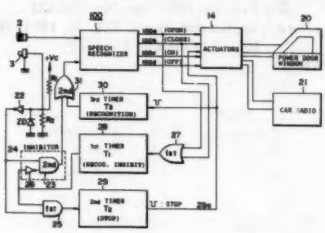
U.S. Cl. 381—43 **14 Claims**

1. A spoken-instruction controlled system for an automotive vehicle which can operate at least one vehicle device in accordance with a plurality of spoken instructions inputted through a microphone when a recognition switch is kept turned on which comprises:

(a) a speed recognizer for outputting a plurality of recogni-

tion command signals independently whenever one of a plurality of predetermined spoken instructions is recognized to be similar to one of recorded reference spoken instruction pattern data;

(b) at least one vehicle device actuator connected between said speech recognizer and the vehicle device for actuating the vehicle device in response to the recognition command signals; and



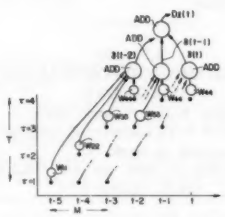
(c) means for outputting a stop command signal to said vehicle device actuator for a predetermined time period T_2 when recognition switch is turned on again within a predetermined time period T_1 after said speech recognizer has outputted a recognition command signal to said vehicle device actuator, said stop command signal outputting means being connected to said speech recognizer and the recognition switch.

4,528,688

CONTINUOUS SPEECH RECOGNITION METHOD

Akira Ichikawa, Musashino; Akio Komatsu, Kodaira, and Yoshiaki Asakawa, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 316,643, Oct. 30, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 601,957
Claims priority, application Japan, Nov. 12, 1980, 55-158297
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **6 Claims**



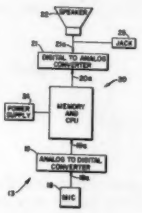
1. A continuous speech recognition method comprising the steps: analyzing a continuous input speech pattern in time series, setting a predetermined two-dimensional mask for successively appointing a one unit region for matching which includes a plurality of analytical points of each of a standard pattern analyzed in time series in advance and the input speech pattern, calculating a parameter corresponding to a degree of similarity between said standard pattern and said input speech pattern within said one unit region on the basis of analytical results at said plurality of analytical points of said standard pattern and aid input speech pattern within said mask including the operations of allotting predetermined weights to respective values corresponding to differences of the analytical results at said plurality of analytical points of said standard pattern and said input speech pattern within said two-dimensional mask, and comparing said parameter corresponding to said degree of similarity with a predetermined threshold value, whereby said input speech pattern is successively recognized in time series.

4,528,689

SOUND MONITORING APPARATUS

Hart V. Katz, Willowdale, Canada, assignor to International Acoustics Incorporated, Palatine, Ill.

Continuation-in-part of Ser. No. 304,607, Sep. 22, 1981,. This application Dec. 7, 1983, Ser. No. 558,746
Int. Cl.³ H04R *23/00*; A61B *5/02*
U.S. Cl. 381—67 **25 Claims**



1. Sound processing and monitoring apparatus for processing an original sound and providing a sound output therefrom such that that sound output is recognizable as a slowed down version of the original sound at the same pitch, the apparatus comprising,

first sound transducer means for producing a cyclically varying analog input signal in response to an input sound;

analog to digital (A/D) converting means connected to said first sound transducer means for converting said analog input signal into a digital input signal;

memory means associated with said A/D converting means for storing said digital signal therein;

control means connected to said memory means for controlling the storage of said digital signal in said memory means, and for causing stored digital data corresponding to each respective analog input half-cycle to be read out of said memory means a predetermined multiple number of times to form a digital output signal;

said control means constituting means effective for controlling the phase of the output;

digital to analog (D/A) converting means for converting said digital output signal into an analog output signal, said analog output signal being composed of groups of said predetermined multiple number of half-cycles, each group corresponding to at least one half-cycle of said analog input signal; and

second sound transducer means connected to the output of said D/A converter for producing an output sound in response to said analog output signal, said output sound being recognizable as a slowed down version of said input sound with the same pitch.

4,528,690

COMPACT HYBRID STETHOSCOPE

Jim Sedgwick, Scarsdale, N.Y., assignor to Genovation, Inc., Glen Cove, N.Y.

Filed Mar. 12, 1984, Ser. No. 588,767
Int. Cl.³ H04R *1/46*; A61B *5/02*
U.S. Cl. 381—67 **3 Claims**

1. A compact hybrid stethoscope for use in ausculation of sounds made within the body, which comprises:

(a) a sound pickup to be held against said body for picking up said sounds;

(b) tubing means pneumatically connected at one end to said sound pickup for transmitting said sounds;

(c) amplifying means which includes:

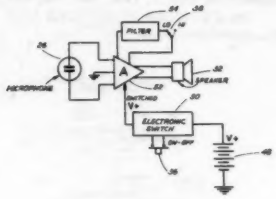
(i) a microphone pneumatically connected to the other

end of said tubing means for converting said sounds into electric signals;

(ii) an amplifier circuit electrically connected to said microphone for amplifying said electric signals;

(iii) an electronic switch connected between said amplifier circuit and a battery, said electronic switch including:

a pair of CMOS schmitt triggers connected across said battery so as to be powered at all times; and



an on/off switch connected to one of said schmitt triggers so that said electronic switch may shut off said amplifier circuit a predetermined period of time after said on/off switch is pressed, and

(iv) a speaker electrically connected to said amplifier circuit for converting said electric signals into acoustic sounds; and

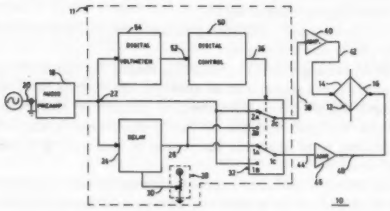
(d) a head set pneumatically connected to said speaker for transmitting said sounds to the user's ears.

4,528,691

ALTERNATING VARIABLE DELAY CONTROL ARRANGEMENT AND METHOD FOR PUSH-PULL AUDIO TRANSDUCERS

Edward W. Edwards, 815 E. Oakton, Box 226, Des Plaines, Ill. 60018

Filed Oct. 11, 1983, Ser. No. 540,539
Int. Cl.[3] H04R *1/02*
U.S. Cl. 381—97 **11 Claims**



1. A control arrangement for a push-pull audio transducer system of the type including two transducers coaxially disposed relative to each other and each including a cone and an electrically actuated drive arrangement for the cone, the bases of the cones being in facing relationship and arranged to define a chamber therebetween, the control arrangement comprising:

delay means connected to an audio signal input source for providing at an output a delayed audio signal that is delayed by a predetermined time interval with respect to the audio signal input source;

means responsive to the audio signal input source for generating a switching control input based on the polarity of the rate of change of the audio signal input source; and

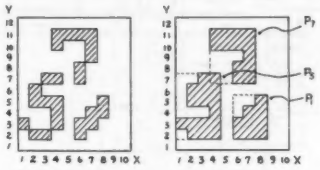
means responsive to said audio signal input source and said delayed audio signal output for selectively connecting each of the drive arrangements for the two transducers to a different one of said delayed audio signal or said audio signal input source in response to said switching control input, said drive arrangements being connected in opposite phase relationship.

4,528,692

CHARACTER SEGMENTING APPARATUS FOR OPTICAL CHARACTER RECOGNITION

Tetsuo Umeda; Kazunari Egami; Naoto Tsukakoshi, and Yasuo Nishijima, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,633
Claims priority, application Japan, Feb. 26, 1981, 56-27512
Int. Cl.[3] G06K *9/34, 9/36*
U.S. Cl. 382—9 **4 Claims**



1. A character segmenting apparatus comprising:

optical scanner means for producing a pattern signal by scanning a surface of an article, the scan being in a first direction which is substantially perpendicular to a second direction which is the direction of relative movement between said optical scanner means and said article;

means for recursively compressing said pattern signal delivered from said optical scanner means in said second direction to deliver a compressed pattern signal;

means for generating a character segmenting signal when no black picture element exists in a portion of said pattern signal which is delivered from said optical scanner means, said portion corresponding to a black picture element contained in an added pattern signal formed by adding said compressed pattern signal and said pattern signal delivered from said optical scanner means; and

means for obtaining information on size and position of a whole segmented character in respo. to said character segmenting signal.

4,528,693

APPARATUS AND METHOD FOR SCALING FACSIMILE IMAGE DATA

Kenneth A. Pearson, Kingston, and Luther L. Zimmerman, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,228
Int. Cl.[3] G06K *9/42*
U.S. Cl. 382—47 **10 Claims**

5. A machine method for converting old images formed as a $M_1 \times N_1$ matrix of gray scale data into new images having different matrix dimensions $M_2 \times N_2$, comprising:

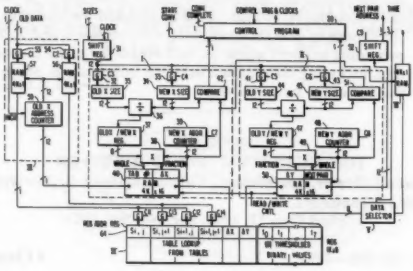
generating scaling factors from said matrix dimensions as M_1/M_2 and N_1/N_2, and multiplying said scaling factors with the address of each new image pel to obtain a whole number TAB, with a remainder dx, and whole number NEXT PAIR with a remainder dy;

each of said TAB and NEXT PAIR numbers identifying a neighborhood of pels of old image data contained in said $M_1 \times N_1$ matrix which contains a pel of new image data contained in said matrix $M_2 \times N_2$, and each of said remainders dx, dy identifying a position within each neighborhood of pels of said new image pel;

addressing a lookup table with a gray scale of the pels comprising each of said neighborhoods and said dx and dy remainders, whereby a plane containing gray scale data for a plurality of locations within said neighborhood is

addressed, and a gray scale of said plane is identified by dx and dy;

whereby gray scale data for each new pel of a new image is



produced by looking up said data as a function of the gray scale of old image pels constituting a neighborhood for said new pel, and the position of each said new pel dx, dy, within said neighborhood.

4,528,694
CARRY-BAG

Leif O. Skovgaard, Oksbol, Denmark, assignor to Gople-Pack and Industrial Marketing ApS, Oksbol, Denmark

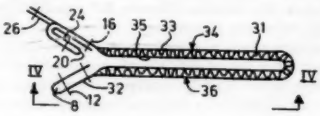
PCT No. PCT/DK81/00055, § 371 Date Jan. 15, 1982, § 102(e) Date Jan. 15, 1982, PCT Pub. No. WO81/03317, PCT Pub. Date Nov. 26, 1981

Continuation of Ser. No. 341,993, Jan. 15, 1982, abandoned. This PCT application May 22, 1981, Ser. No. 600,199

Claims priority, application Denmark, May 22, 1980, 2247/80

Int. Cl.³ A45C *3/04;* **B65D** *30/08, 33/06*

U.S. Cl. 383—10 **8 Claims**



1. A carrier bag comprising:

a first wall sheet;

a second wall sheet joining said first wall sheet along two opposed side edges and along a bottom edge so as to define a bag portion;

a top portion of said first wall sheet being folded upon itself to define an insertion pocket having an entry edge located at an inner side of said first wall sheet, when said bag is in an open condition and said top portion of said first wall sheet includes a cut defining a first gripping opening and a closing flap;

a top portion of said second wall sheet defining an insertion flap adapted for introduction into the interior of said insertion pocket;

a second gripping opening defined by said insertion flap adapted for introduction into the interior of said insertion pocket so that said first gripping opening and said second gripping opening are at least partially coextensive when said insertion flap is received in said insertion pocket;

said closing flap having a free front edge, the size and location of said closing flap being so adapted that said closing flap extends through said first gripping opening and said second gripping opening when said insertion flap is received in said insertion pocket to close access to the interior of said bag portion at said first gripping opening and said second gripping opening; and

means for removably attaching said free front edge of said closing flap to the outer side of said second wall sheet when said insertion flap is received in said insertion pocket.

4,528,695
DISTRIBUTION SYSTEM FOR A LOCAL FIBRE NETWORK

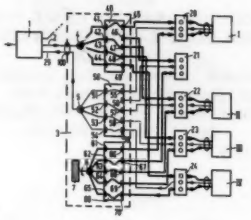
Giok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,454

Claims priority, application Netherlands, Dec. 7, 1982, 8204722

Int. Cl.³ H04B *9/00*

U.S. Cl. 455—612 **5 Claims**



1. A distribution system for a local fibre network comprising a distribution unit which is connected through one or more optical transmission fibres to a number of subscriber's premises, each subscriber's premises being provided with a common terminal unit, which has at least one input, the input being connected through at least a first power splitter to a first distribution box, outputs of the first distribution box being connected through a first network of optical fibres to respective optical sockets, on output of the terminal unit being connected through a second power splitter to a second distribution box, inputs of the second distribution box being connected through a second set of optical fibres to said sockets, the numerical aperture on the optical axis and the core diameter of the first set of optical fibres and of optical fibres present between the inputs of the first distribution box and the first power splitter being larger than the numerical aperture and the core diameter of the second set of optical fibres of the distribution system, characterized in that the terminal unit comprises a third distribution box, outputs of the third distribution box being connected through a third set of fibres to said sockets, inputs of the third distribution box being connected through a third power splitter to an optical filter.

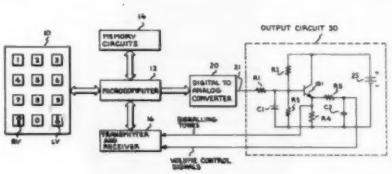
4,528,696
ARRANGEMENT FOR PROVIDING SIGNALLING TONES AND VOLUME CONTROL SIGNALS

Robert J. Martin, III, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 25, 1983, Ser. No. 488,267

Int. Cl.³ H04B *1/38*

U.S. Cl. 455—73 **7 Claims**



1. An arrangement for providing signalling tones to a radio

transmitter and volume control signals to a radio receiver, comprising:

a. a keyboard having signalling tone pushbuttons and volume control pushbuttons;

b. means coupled to said keyboard for producing signalling tones in response to operation of said radio transmitter and said signalling tone pushbuttons, and for producing volume control signals in response to operation of said radio receiver and said volume control pushbuttons;

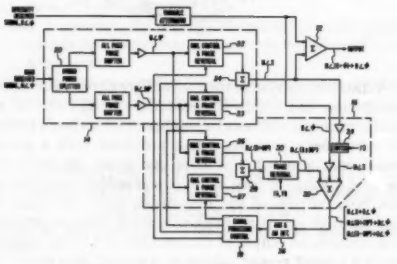
c. and an output circuit coupled to said producing means for supplying signalling tones to said radio transmitter and for supplying volume control signals to said radio receiver.

4,528,697

BROADBAND QUADRATURE PHASE MODULATOR FOR CONTROL LOOP ERROR GENERATION IN AN IF COMBINER

Richard A. Nichols, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 26, 1983, Ser. No. 498,369
Int. Cl.³ H04B *1/16, 7/02*
U.S. Cl. 455—139 **11 Claims**



2. Circuitry for use in an IF combiner having means for combining signals of first and second receiver paths, such as main and diversity receiver paths, with one of said paths including means for controlling the phase of the signal therein, thereby to provide the signal, with a controlled phase designated as X, to said means for combining, the signal in the order of said paths a phase designated as ϕ, said circuitry comprising:

means for deriving from said first receiver path a broadband phase-modulated version of a signal in said first path modulated alternately by a phase angle of $+90°$ and $-90°$; and

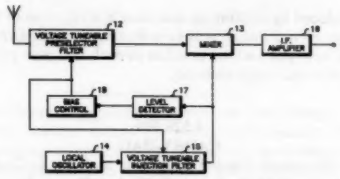
means, responsive to said phase modulated version and to the signals of said receiver paths with phases ϕ and X, for providing an error signal for said means for phase controlling, including information as to the difference in phase of the signals to be combined.

4,528,698

TUNING SYSTEM FOR RF RECEIVER

Robert J. Fraser, Scarborough, Canada, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1983, Ser. No. 564,130
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—319 **8 Claims**



1. In a heterodyne receiver, a tuning system comprising:

a mixer;

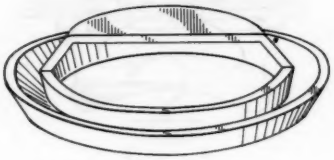
a tunable preselector filter for filtering an incoming RF signal and applying the filtered signal to said mixer to be heterodyned;

a local oscillator;

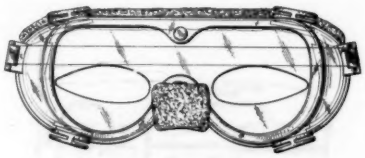
a tunable injection filter for filtering the output of said local oscillator and applying the filtered output to said mixer to heterodyne the filtered incoming RF signal into an intermediate frequency signal; and

tuning control means responsive to the power output of said injection filter for adjusting both said injection filter and said preselector filter to appropriate frequencies for heterodyning of the radio frequency signal into the intermediate frequency.

279,515
AIR VENT ATTACHMENT FOR CRASH HELMETS
Calvin P. Peyton, 1968 Earle St., Klamath Falls, Oreg. 97601
Filed Feb. 9, 1983, Ser. No. 465,199
Term of patent 14 years
U.S. Cl. D2—233



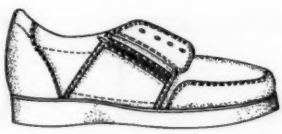
279,516
GOGGLES
Thomas R. Bieder, 1960 Williamsbridge Rd., Bronx, N.Y. 10462
Filed Oct. 20, 1983, Ser. No. 543,819
Term of patent 14 years
U.S. Cl. D2—234



279,517
SHOE
Steven M. Foldes, Conyngham, Pa., assignor to Fun Footwear Co., West Hazleton, Pa.
Filed Oct. 31, 1984, Ser. No. 666,661
Term of patent 14 years
U.S. Cl. D2—291

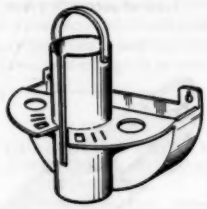
279,518
SHOE
Steven M. Foldes, Conyngham, Pa., assignor to Fun Footwear Co., West Hazleton, Pa.
Filed Oct. 31, 1984, Ser. No. 666,779
Term of patent 14 years
U.S. Cl. D2—291

279,519
CASUAL SHOE WITH POCKET
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Aug. 16, 1982, Ser. No. 408,650
Term of patent 14 years
U.S. Cl. D2—313



279,520
HUNTING HARNESS
James Brinson, Jr., 2067 Wharton Dr., Augusta, Ga. 30904, assignor to Brinson, Jr., James, Augusta, Ga.
Filed Sep. 14, 1981, Ser. No. 301,734
Term of patent 14 years
U.S. Cl. D2—382

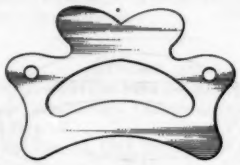
279,521
DETACHABLE CARRIER FOR PICNIC PLATES, CUPS AND ACCESSORIES
Frank Zucker, 501 Anita St., Chula Vista, Calif. 92011
Filed Feb. 18, 1983, Ser. No. 447,766
Term of patent 14 years
U.S. Cl. D3—30.1



279,522
EYEGLASS CASE
Ronald Scoppettone, 25 Redfearn La., Alamo, Calif. 94507
Filed Feb. 28, 1983, Ser. No. 470,204
Term of patent 14 years
U.S. Cl. D3—34

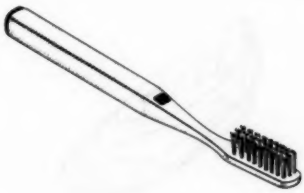
279,523
AUTOMOBILE DASH TRAY
Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.
Filed Jan. 10, 1983, Ser. No. 456,991
Term of patent 14 years
U.S. Cl. D3—40

279,524
KEY RING
John Y. Enomoto, 2035 Heather Dr., Monterey Park, Calif. 91754
Filed Feb. 28, 1983, Ser. No. 469,766
Term of patent 14 years
U.S. Cl. D3—61

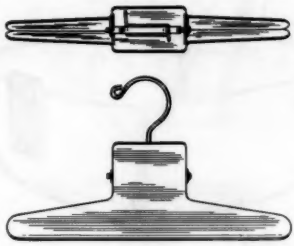


279,525
EXPANDABLE MULTI-COMPARTMENT BAG
James H. Allen, Covington, Ky., assignor to 'totes' incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,053
Term of patent 14 years
U.S. Cl. D3—71

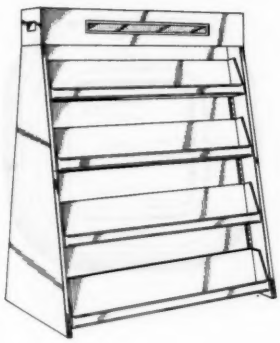
279,526
TOOTHBRUSH
Georges Sturdza, Paris, France, assignor to La Brosse Et Dupont, S.A., Paris, France
Filed Nov. 28, 1983, Ser. No. 555,575
Term of patent 14 years
U.S. Cl. D4—104



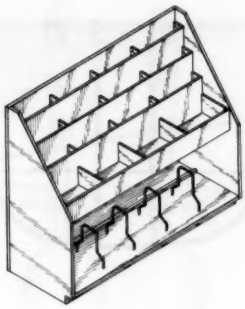
279,527
GARMENT HANGER
Kenneth E. Peterson, 9311 Bryant Ave. South, Minneapolis, Minn. 55420
Filed Apr. 6, 1983, Ser. No. 482,561
Term of patent 14 years
U.S. Cl. D6—326



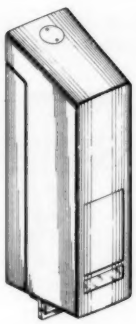
279,528
BOOK RACK OR SIMILAR ARTICLE
Eleanor V. Kingsley, Claremont, Calif., assignor to Jackson Manufacturing Company, Inc., Pomona, Calif.
Filed Sep. 30, 1982, Ser. No. 430,138
Term of patent 14 years
U.S. Cl. D6—473



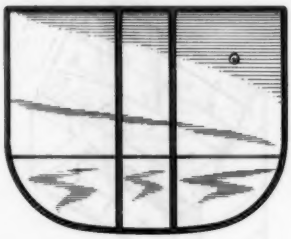
279,529
DISPLAY RACK
Myron L. Denhoff, New York, N.Y., assignor to Myden Industries, Inc., New York, N.Y.
Filed Feb. 28, 1983, Ser. No. 470,228
Term of patent 14 years
U.S. Cl. D6—474



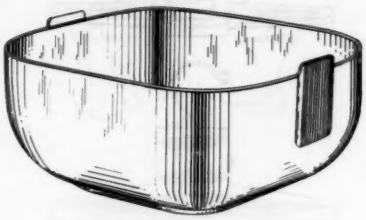
279,530
SOAP DISPENSER
John vonBuelow, Woodland Hills, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed Jun. 3, 1983, Ser. No. 500,737
Term of patent 14 years
U.S. Cl. D6—545

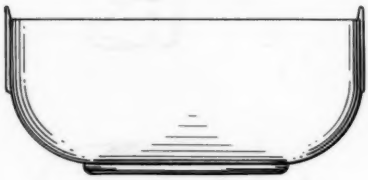


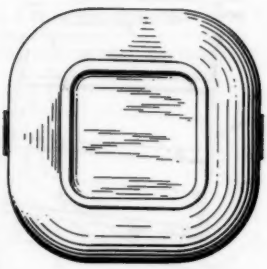
279,531
PILLOW OR SIMILAR ARTICLE
Sydney M. Rogers, Jr., 16 N. Chatsworth Ave., Larchmont, N.Y. 10538
Filed Mar. 7, 1983, Ser. No. 473,193
Term of patent 14 years
U.S. Cl. D6—601



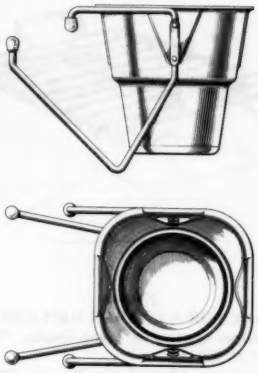
279,532
BOWL
Ambrogio Pozzi, Gallarate, Italy, assignor to F.lli Guzzini S.p.A., Recanati, Italy
Filed Dec. 16, 1982, Ser. No. 450,342
Claims priority, application Italy, Jun. 16, 1982, 22175/82[U]
Term of patent 14 years
U.S. Cl. D7—21

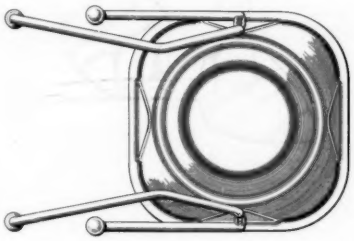




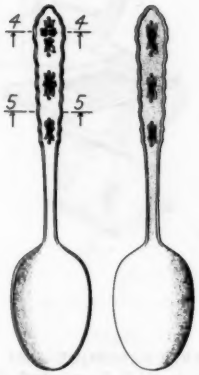


279,533
WINE BUCKET
Richard F. Gildart, 10051 Aspen Cir., Santa Fe Spring, Calif. 90670
Filed Feb. 16, 1983, Ser. No. 445,664
Term of patent 14 years
U.S. Cl. D7—70





279,534
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida, Ltd., Oneida, N.Y.
Filed Sep. 27, 1982, Ser. No. 424,547
Term of patent 14 years
U.S. Cl. D7—150

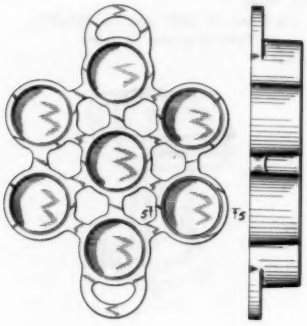


279,535
FLOOR BARBEQUE GAS UNIT
John N. Taylor, and Donald W. Nygren, both of St. Louis Park, Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.
Filed Aug. 8, 1983, Ser. No. 520,985
Term of patent 14 years
U.S. Cl. D7—334

279,536
COOKING GRILL
Charlie Braswell, Rte. 2, Box 248, Burnet, Tex. 78611
Filed Mar. 9, 1983, Ser. No. 473,655
Term of patent 14 years
U.S. Cl. D7—335

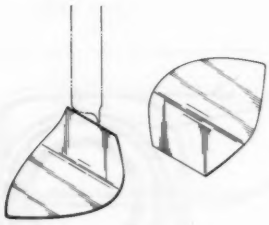
279,537
TABLE BARBEQUE UNIT
John N. Taylor, and Donald W. Nygren, both of St. Louis Park, Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.
Filed Aug. 8, 1983, Ser. No. 520,910
Term of patent 14 years
U.S. Cl. D7—337

279,538
POPOVER BAKING PAN
Ralph E. Throm, 11 Llewellyn Pl., New Brunswick, N.J. 08901
Filed Oct. 27, 1983, Ser. No. 546,098
Term of patent 14 years
U.S. Cl. D7—357

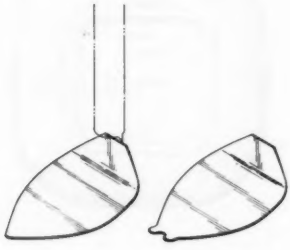


279,539
BACON COOKING RACK
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 6, 1982, Ser. No. 395,658
Term of patent 14 years
U.S. Cl. D7—359

279,540
BLADE FOR A GARDEN IMPLEMENT
Vincente Rodrigues-Quiros, 78 Loma Bonita, Pla Sabanetas, Mercedita, P.R. 00715
Filed Apr. 12, 1983, Ser. No. 484,379
Term of patent 14 years
U.S. Cl. D8—11



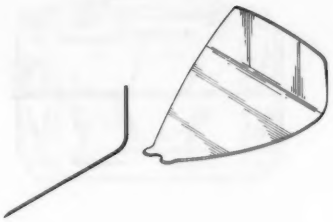
279,541
BLADE FOR A GARDEN IMPLEMENT
Vincente Rodrigues-Quiros, 78 Loma Bonita, Pla Sabanetas, Mercedita, P.R. 00715, and Edwin Lopez-Montalvo, 3519 Andy St., Long Beach, Calif. 90805
Filed Apr. 28, 1983, Ser. No. 489,240
Term of patent 14 years
U.S. Cl. D8—11



279,542
BLADE FOR A GARDEN IMPLEMENT

Vincente Rodrigues-Quiros, 78 Loma Bonita, Pla Sabanetas, Mercedita, P.R. 00715

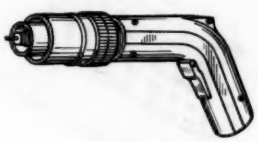
Filed Apr. 12, 1983, Ser. No. 484,380
Term of patent 14 years
U.S. Cl. D8—11



279,543
WELDING TORCH HAVING A BUILT-IN SMOKE EXHAUSTER COMBINATION TYPE

Anatoly P. Pashkov, ulitsa Lastochkina, 5, kv. 38; Efim G. Kipernik, ulitsa Yakira, 53, kv. 50; Anatoly V. Onischenko, ulitsa Karla Marxa, 70, kv. 9; Valentin S. Sakharov, prospekt Shevchenko, 23, kv. 37; Mikhail M. Kudryashev, ulitsa Bebelya, 23, kv. 19; Oleg P. Karpov, ulitsa Gogolya, 7, kv. 25; Illary A. Yavorsky, ulitsa Ostrovidova, 46 "A", kv. 16, and Boris V. Gizer, ulitsa Generala Bocharova, 42, kv. 288, all of Odessa, U.S.S.R.

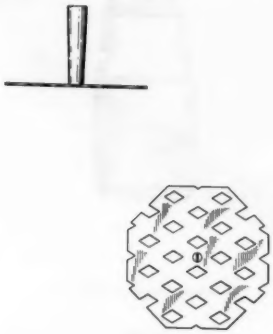
Filed Jan. 27, 1982, Ser. No. 343,319
Term of patent 14 years
U.S. Cl. D8—30



279,544
MUD BROCADING TOOL

Don Duncan, 5370 Grove St., West Linn, Oreg. 97068

Filed Sep. 16, 1983, Ser. No. 532,751
Term of patent 14 years
U.S. Cl. D8—45



279,545
STRIPPING TOOL

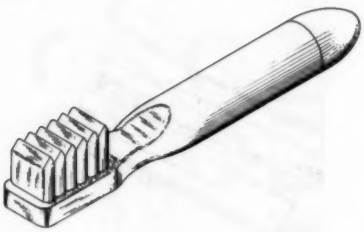
Mats Norin, Älvdalen, and Ulf Hanses, Borlänge, both of Sweden, assignors to Pressmaster Innovation AB, Alvadalen, Sweden

Filed Jul. 16, 1982, Ser. No. 398,840
Claims priority, application Sweden, Jan. 18, 1982, 82-0088
Term of patent 14 years
U.S. Cl. D8—51

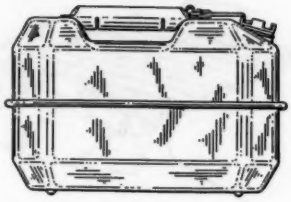
279,546
BOTTLE OR THE LIKE
Paul Marcus, 85 Pascack Rd., Pearl River, N.Y. 10965
Filed Apr. 13, 1983, Ser. No. 484,705
Term of patent 14 years
U.S. Cl. D9—349

279,547
FLASK
Charles S. Tobias, Tortola, British Virgin Isls., assignor to Pusser's, Inc., Tortola, British Virgin Isls.
Filed Jun. 21, 1983, Ser. No. 506,464
Term of patent 14 years
U.S. Cl. D9—372

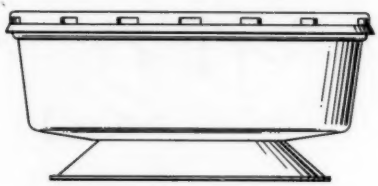
279,548
TOOTHPASTE CONTAINER
Mary J. Schildknecht, 6202 Upper Hunters Trace Rd., Louisville, Ky. 40216
Filed Feb. 22, 1983, Ser. No. 468,345
Term of patent 14 years
U.S. Cl. D9—307



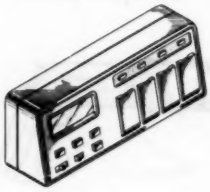
279,549
FUEL CONTAINER
John R. Elmburg, Miami, Okla., assignor to U. S. Metal Container Company, Miami, Okla.
Division of Ser. No. 397,675, Jul. 12, 1982,. This application Sep. 4, 1984, Ser. No. 647,154
Term of patent 14 years
U.S. Cl. D9—376



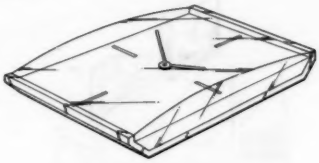
279,550
PACKAGING CUP WITH A PEDESTAL BASE
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Oct. 15, 1982, Ser. No. 434,699
Term of patent 14 years
U.S. Cl. D9—388



279,551
TIMED MEDICATION DISPENSER
Andrew B. Claytor, III, P.O. Box 612, Bedford, Va. 24523
Filed Jun. 20, 1983, Ser. No. 505,029
Term of patent 14 years
U.S. Cl. D10—2

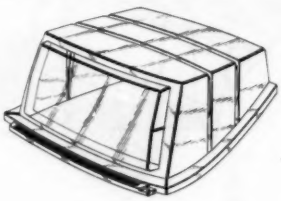


279,552
WATCH
Umberto Maglioli, Monza, Italy, assignor to Orfina Uhren AG, Grenchen, Switzerland
Filed Mar. 18, 1983, Ser. No. 476,896
Term of patent 14 years
U.S. Cl. D10—39

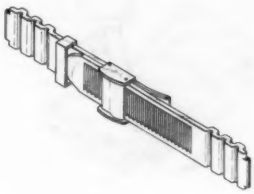


279,553
TAPE RULE
Mark A. Drechsler, Southington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jun. 13, 1983, Ser. No. 503,236
Term of patent 14 years
U.S. Cl. D10—72

279,554
FLUID METER INSTRUMENT COVER
Irwin A. Hicks, Radnor, Pa., assignor to The Singer Company, Stamford, Conn.
Filed May 4, 1983, Ser. No. 491,501
Term of patent 14 years
U.S. Cl. D10—103

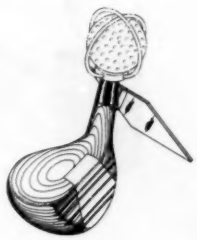


279,555
WATCH BAND
Jiro Matsuo, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Aug. 24, 1983, Ser. No. 526,147
Claims priority, application Japan, Jun. 23, 1983, 58-27178
Term of patent 14 years
U.S. Cl. D11—4



279,556
GOLF DOOR TROPHY
Claude L. McJunkin, 12184 - 111th La. North, Largo, Fla. 33544
Filed Nov. 15, 1982, Ser. No. 441,663
Term of patent 14 years
U.S. Cl. D11—133

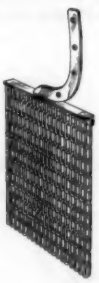
279,557
GOLF WOOD TROPHY
Claude L. McJunkin, 12184 - 111th La., North, Largo, Fla. 33544
Filed Nov. 15, 1982, Ser. No. 441,768
Term of patent 14 years
U.S. Cl. D11—157



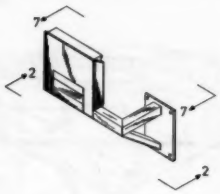
279,558
GOLF IRON TROPHY
Claude L. McJunkin, 12184 - 111th La., Largo, Fla. 33544
Filed Nov. 15, 1982, Ser. No. 441,769
Term of patent 14 years
U.S. Cl. D11—157

279,559
NOVELTY SCULPTURE
Steven D. Beltrand, 8101 E. Palm La., Scottsdale, Ariz. 85257
Filed Aug. 17, 1982, Ser. No. 408,943
Term of patent 14 years
U.S. Cl. D11—157

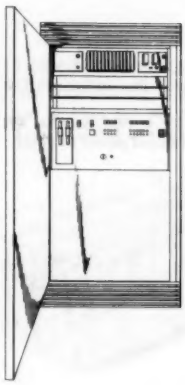
279,560
MUD FLAP
Edward A. Jensen, R.R. #1, 86-K, Wentworth, S. Dak. 57075
Filed Jan. 17, 1983, Ser. No. 458,620
Term of patent 14 years
U.S. Cl. D12—185



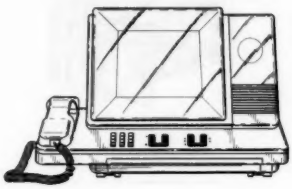
279,561
BOAT MOTOR MOUNT
Robert H. Hathorne, 18287 W. 58th Dr., Golden, Colo. 80403
Filed Apr. 9, 1984, Ser. No. 598,212
Term of patent 14 years
U.S. Cl. D12—317

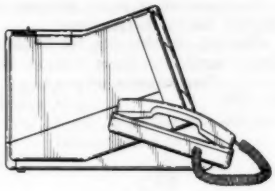


279,562
DIGITAL TELEPHONE EXCHANGE EQUIPMENT CABINET OR SIMILAR ARTICLE
Ronald Wood, c/o Norton Telecommunications, Inc., Atrium Plz., 1515 N. Federal Hwy., Suite 300, Boca Raton, Fla. 33432
Filed Feb. 25, 1983, Ser. No. 469,915
Term of patent 14 years
U.S. Cl. D14—52



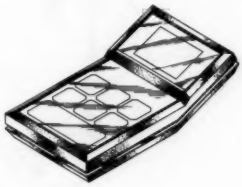
279,563
COMBINED TELEPHONE AND VISUAL DISPLAY UNIT
Laurent Menei, 16 Ave. Jean Lurcat, 49240 Avrille, and Gérard Vergneau, 22 Rue de l'Eglise á Sorges, 49130 Les Ponts de ce, both of France
Filed Nov. 23, 1982, Ser. No. 443,991
Claims priority, application France, Jun. 1, 1982, 821907
Term of patent 14 years
U.S. Cl. D14—54



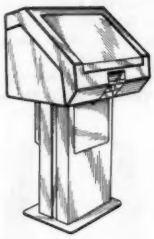


279,564
MICROCOMPUTER
Harold R. Anderson, Orange, and Savas Mirci, Irvine, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Dec. 7, 1981, Ser. No. 327,843
Term of patent 14 years
U.S. Cl. D14—100

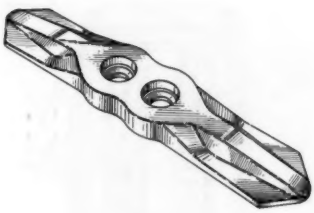
279,565
BICYCLE COMPUTER
James M. Forbis, Longmont, and Paul W. Panish, Lyons, both of Colo., assignors to Optek Research Partners Limited, Longmont, Colo.
Filed Dec. 27, 1982, Ser. No. 453,368
Term of patent 14 years
U.S. Cl. D14—100



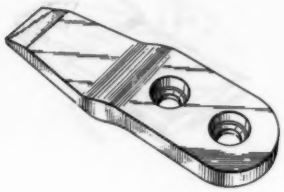
279,566
AUTOMATED CREDIT CARD TERMINAL ENCLOSURE FOR VEHICLE SERVICE STATIONS
Robert Case, Chicago, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Aug. 23, 1982, Ser. No. 410,219
Term of patent 14 years
U.S. Cl. D14—102



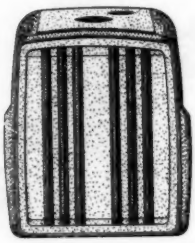
279,567
TOOTH FOR BUCKETS ON DIGGING AND LOADING MACHINES
Olav Nja, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Oct. 17, 1983, Ser. No. 542,409
Claims priority, application Norway, Apr. 29, 1983, 63993
Term of patent 14 years
U.S. Cl. D15—29



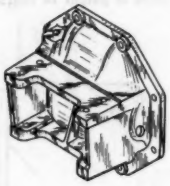
279,568
TOOTH FOR BUCKETS ON DIGGING AND LOADING MACHINES
Olav Nja, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Jun. 6, 1983, Ser. No. 501,076
Claims priority, application Norway, Dec. 28, 1982, 63618
Term of patent 14 years
U.S. Cl. D15—29



279,569
TRACTOR ENGINE HOOD
Stephen G. Miggels, Wyckoff, N.J., and Stanley E. Thorwaldsen, Grosse Pointe Farms, Mich., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Jan. 4, 1982, Ser. No. 336,864
Term of patent 14 years
U.S. Cl. D15—31



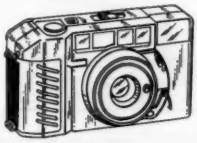
279,570
END CAP FOR AUTOMOBILE DIFFERENTIAL
Carl A. Gentile, 260 Chase Rd., Columbus, Ohio 43214
Filed Nov. 4, 1981, Ser. No. 318,314
Term of patent 14 years
U.S. Cl. D15—149



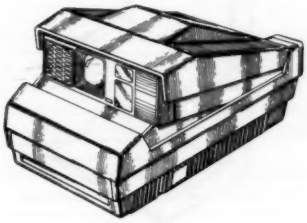
279,571
INDUSTRIAL ROBOT
Shinji Arai, Aichi; Yoshio Sanada, Gifu, and Takanobu Fujimoto, Kanagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 25, 1983, Ser. No. 516,500
Claims priority, application Japan, Mar. 14, 1983, 58-10475
Term of patent 14 years
U.S. Cl. D15—199

279,572
INDUSTRIAL ROBOT
Hirotoshi Yasuoka, Aichi, and Takanobu Fujimoto, Kanagawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 25, 1983, Ser. No. 516,498
Claims priority, application Japan, Mar. 22, 1983, 58-11698
Term of patent 14 years
U.S. Cl. D15—199

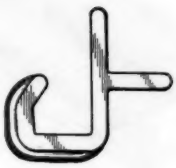
279,573
CAMERA
Nobuhiro Agou, and Shuichi Tamura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 13, 1983, Ser. No. 503,896
Claims priority, application Japan, Dec. 24, 1982, 57-59303
Term of patent 14 years
U.S. Cl. D16—1



279,574
FOLDING PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
James M. Conner, Old Greenwich, Conn.; Peter F. Costa, Winthrop, Mass.; James M Ryan, New York, N.Y., and George D. Whiteside, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed May 27, 1983, Ser. No. 498,980
Term of patent 14 years
U.S. Cl. D16—5

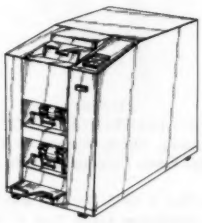


279,575
CLIP FOR AN EYE GLASS LENS OCCLUDER
Arthur C. Jermyn, 15914 Overview Rd., Poway, Calif. 92064
Filed Sep. 22, 1982, Ser. No. 421,079
Term of patent 14 years
U.S. Cl. D16—128

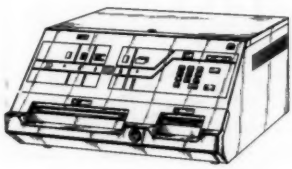


279,576
BASS DRUM BEATER
Timothy A. Norris, 492 Cummings La., Salem, Oreg. 97303
Filed Feb. 25, 1983, Ser. No. 469,988
Term of patent 14 years
U.S. Cl. D17—22

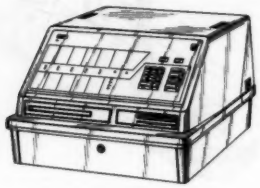
279,577
BANK NOTE SORTING MACHINE
Takashi Kajita, Kodaira, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jan. 4, 1983, Ser. No. 455,546
Claims priority, application Japan, Jul. 7, 1982, 57-30353
Term of patent 14 years
U.S. Cl. D18—3



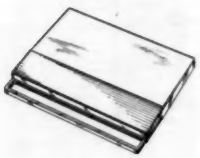
279,578
CASH DISPENSING MACHINE
Yoshiaki Nishida, Omorinishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jan. 4, 1983, Ser. No. 455,513
Claims priority, application Japan, Jul. 14, 1982, 57-31379
Term of patent 14 years
U.S. Cl. D18—3



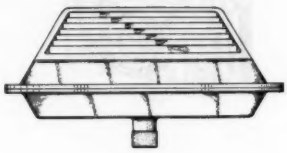
279,579
CASH DISPENSING MACHINE
Yoshiaki Nishida, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Nov. 9, 1983, Ser. No. 550,126
Claims priority, application Japan, May 12, 1983, 58-19653
Term of patent 14 years
U.S. Cl. D18—4



279,580
PORTABLE ELECTRONIC CALCULATOR
Masaki Kurihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Epson Corporation, both of Tokyo, Japan, a part interest
Filed May 2, 1983, Ser. No. 490,707
Claims priority, application Japan, Nov. 2, 1982, 57-49856
Term of patent 14 years
U.S. Cl. D18—7

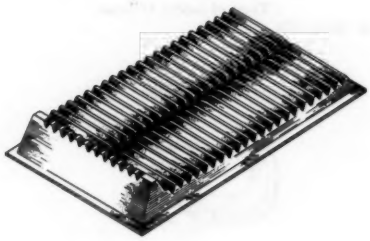


279,581
INK CARTRIDGE FOR AN INK JET PRINTER OR SIMILAR ARTICLE
Vincent A. Juliana, Exton, Pa.; Viacheslav B. Maltsev, Stormville, N.Y., and Frank L. Roe, Brookfield Center, Conn., assignors to Exxon Research & Engineering Company, Florham Park, N.J.
Filed Dec. 27, 1982, Ser. No. 453,238
Term of patent 14 years
U.S. Cl. D18—22

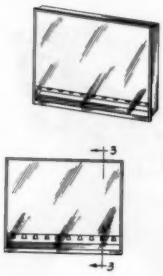


279,582
COMPUTER PAPER FEEDER
Billy R. Ringer, Sr., Houston, Tex., assignor to Crestmont Corporation, Houston, Tex.
Filed Jul. 14, 1983, Ser. No. 513,715
Term of patent 14 years
U.S. Cl. D18—22

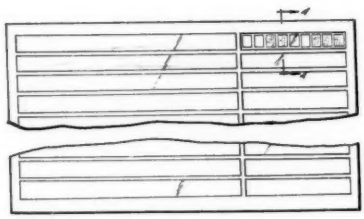
279,583
PENCIL, PEN AND BRUSH PALLET
Robert H. Hall, 415 Sherbrooke Ave., Williamsville, N.Y. 14221
Filed Jan. 10, 1983, Ser. No. 457,120
Term of patent 14 years
U.S. Cl. D19—77



279,584
VENDING MACHINE FRONT PANEL ASSEMBLY
Joseph N. Abraham, 4290 Silsby Rd., University Heights, Ohio 44118
Filed Jan. 6, 1983, Ser. No. 455,929
Term of patent 14 years
U.S. Cl. D20—8



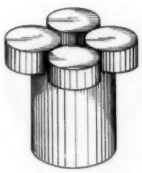
279,585
SIGN
Patrick J. Seggerson, and Donald H. Niehaus, both of Villa Hills, Ky., assignors to American Sign and Marketing Services, Inc., Florence, Ky.
Filed Nov. 24, 1981, Ser. No. 324,535
Term of patent 14 years
U.S. Cl. D20—10



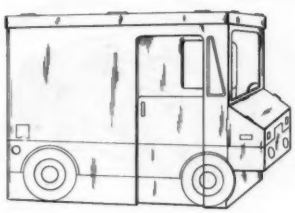
279,586
IDENTIFICATION TAG
William P. Flies, Burnsville, Minn., assignor to Datakey, Inc., Burnsville, Minn.
Filed Feb. 28, 1983, Ser. No. 470,206
Term of patent 14 years
U.S. Cl. D20—22

279,587
CHARACTER-CARRIER ROW STRIP FOR A CHANGEABLE SIGN PANEL OR SIMILAR ARTICLE
Patrick J. Seggerson, and Donald H. Niehaus, both of Villa Hills, Ky., assignors to American Sign and Marketing Services, Inc., Florence, Ky.
Filed Nov. 24, 1981, Ser. No. 324,534
Term of patent 14 years
U.S. Cl. D20—42

279,588
CHESS PIECE
James Danner, 4241 N. Winchester Ave., Chicago, Ill. 60603
Filed Nov. 10, 1982, Ser. No. 440,511
Term of patent 14 years
U.S. Cl. D21—52

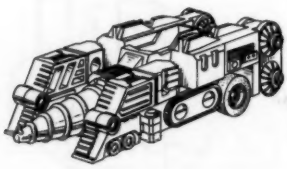


279,589
TOY DELIVERY TRUCK
Donald E. Marshall, Middlesex Boro, N.J., assignor to Container Corporation of America, Chicago, Ill.
Filed Oct. 18, 1982, Ser. No. 434,882
Term of patent 14 years
U.S. Cl. D21—78

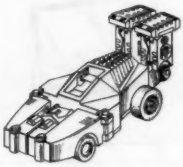


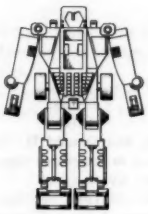
279,590
TOY LAWN TRIMMER
Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed Jan. 19, 1983, Ser. No. 459,108
Term of patent 14 years
U.S. Cl. D21—122

279,591
RECONFIGURABLE CONSTRUCTION VEHICLE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jul. 29, 1983, Ser. No. 518,374
Term of patent 14 years
U.S. Cl. D21—132



279,592
RECONFIGURABLE TOY CAR
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jul. 29, 1983, Ser. No. 518,353
Term of patent 14 years
U.S. Cl. D21—136





279,593
TOY VEHICLE
Justine M. Dantzer, Redondo Beach, Calif., assignor to American Greetings Corporation, Cleveland, Ohio
Filed Mar. 17, 1983, Ser. No. 476,167
Term of patent 14 years
U.S. Cl. D21—136

279,594
COWPERSON CROQUET WICKET
Alva S. Chamberlin, Daytona Beach, Fla., assignor to James G. Murphy, Fairfax, Va.
Filed Sep. 9, 1982, Ser. No. 416,342
Term of patent 14 years
U.S. Cl. D21—202

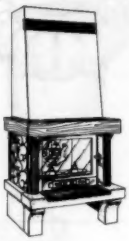
279,595
FLOTATION VEST HAVING AN INFLATABLE CHAMBER
Karla R. Evert, St. Cloud, Minn., assignor to Stearns Manufacturing Company, St. Cloud, Minn.
Filed Mar. 7, 1983, Ser. No. 472,929
Term of patent 14 years
U.S. Cl. D21—238

279,596
FAUCET HANDLE
Manfred Rademacher, Freiligrathstrasse 19, 4 Düsseldorf, Fed. Rep. of Germany
Filed May 26, 1983, Ser. No. 498,415
Term of patent 14 years
U.S. Cl. D23—28

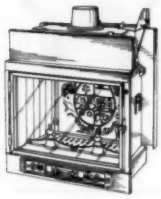
279,597
FAUCET HANDLE
Manfred Rademacher, Freiligrathstrasse 19, 4 Düsseldorf, Fed. Rep. of Germany
Filed May 26, 1983, Ser. No. 498,413
Term of patent 14 years
U.S. Cl. D23—28

279,598
SPOUT
Manfred Rademacher, Freiligrathstrasse 19, 4 Düsseldorf, Fed. Rep. of Germany
Filed May 26, 1983, Ser. No. 498,414
Term of patent 14 years
U.S. Cl. D23—32

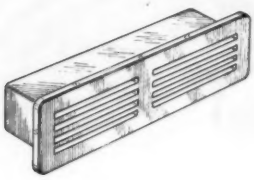
279,599
FIREPLACE
Jean Blum, 13 Haute Corniche, 67210 Obernai (Bas-Rhin), France
Filed Aug. 9, 1983, Ser. No. 521,552
Claims priority, application France, Feb. 10, 1983, 830478
Term of patent 14 years
U.S. Cl. D23—94



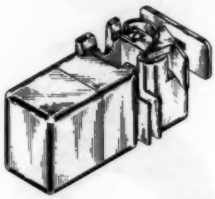
279,600
HEARTH
Jean Blum, 13 Haute Corniche, 67210 Obernai (Bas-Rhin), France
Filed Aug. 9, 1983, Ser. No. 521,551
Claims priority, application France, Feb. 10, 1983, 830478
Term of patent 14 years
U.S. Cl. D23—94



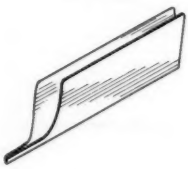
279,601
AIR VENT
John M. Sexton, 424 N. Meridian, Belle Plaine, Minn. 56011
Filed Sep. 2, 1982, Ser. No. 414,562
Term of patent 14 years
U.S. Cl. D23—112



279,602
FLOW DETECTOR FOR AN INTRAVENOUS ADMINISTRATION SET
Herbert F. D'Alo, Crystal Lake; Joseph N. Genese, and Ronald W. Smith, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Mar. 22, 1982, Ser. No. 360,505
The portion of the term of this patent subsequent to Apr. 10, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—8

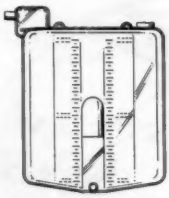


279,603
DENTAL HYGIENE TOOL FOR CLEANING BETWEEN THE TEETH
Arden L. Thorsbakken, Hudson, Wis., assignor to Ardent Inc., Hudson, Wis.
Filed Dec. 1, 1982, Ser. No. 445,958
Term of patent 14 years
U.S. Cl. D24—10



279,604
TUBULAR INSERT FOR AN ENDOSCOPE TELESCOPE HEATER
Shinichi Nishigaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 13, 1982, Ser. No. 368,044
Claims priority, application Japan, Nov. 19, 1981, 56-51509
Term of patent 14 years
U.S. Cl. D24—29

279,605
DISPOSABLE URINE COLLECTION CONTAINER
Larry K. Blankenship, Ramona, Calif., assignor to Vitalmetrics, Inc., San Diego, Calif.
Filed Nov. 22, 1982, Ser. No. 443,281
Term of patent 14 years
U.S. Cl. D24—59

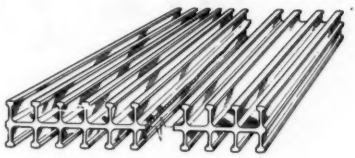


279,606
FOLDABLE SAWHORSE
Melvin Merians, Larchmont, N.Y., assignor to Oxwall Tool Company, Inc., Flushing, N.Y.
Filed Feb. 7, 1983, Ser. No. 464,154
Term of patent 14 years
U.S. Cl. D25—67

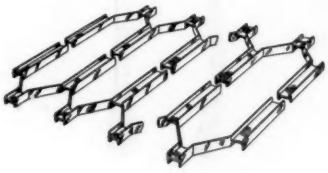
279,607
STEP PLATE
Thomas M. Rutter, Elkhart, Ind., assignor to Elkhart Machine & Tool Co., Elkhart, Ind.
Filed Dec. 27, 1982, Ser. No. 453,705
Term of patent 14 years
U.S. Cl. D25—69

279,608
COLUMN ENCLOSURE
Bruce P. Carey, Saugus, Calif., assignor to Integrated Ceilings, Inc., Los Angeles, Calif.
Filed Nov. 29, 1982, Ser. No. 445,023
Term of patent 14 years
U.S. Cl. D25—77

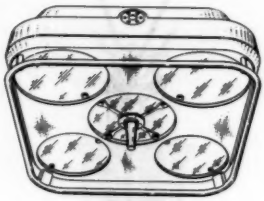
279,609
EXTRUDED METAL PANEL
Trevor K. Dutch, 26 Fraser St., Narrabri 2390, New South Wales, Australia
Filed Aug. 20, 1982, Ser. No. 409,915
Claims priority, application Australia, May 26, 1982, 88228
Term of patent 14 years
U.S. Cl. D25—80



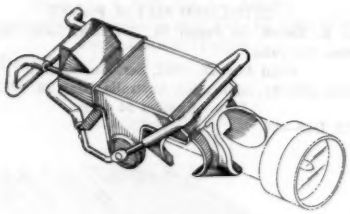
279,610
EXPANDED METAL PANEL
Trevor K. Dutch, 26 Fraser St., Narrabri 2390, New South Wales, Australia
Filed Aug. 20, 1982, Ser. No. 409,916
Claims priority, application Australia, May 26, 1982, 88813
Term of patent 14 years
U.S. Cl. D25—88



279,611
SURGICAL LIGHT
Donald H. Peeler, Pittsford, and Daniel Calabra, Henrietta, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Nov. 22, 1982, Ser. No. 443,246
Term of patent 14 years
U.S. Cl. D26—65

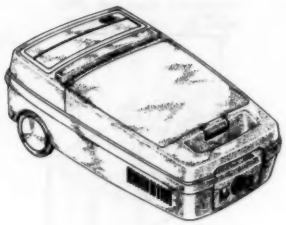


279,612
CLAMP FOR PORTABLE LIGHT OR SIMILAR ARTICLE
Joseph G. Bacevius, 780 Bridgeport Ave., Shelton, Conn. 06484
Filed Dec. 3, 1982, Ser. No. 446,494
Term of patent 14 years
U.S. Cl. D26—138

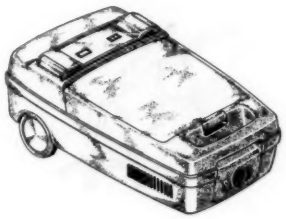


279,613
SAFETY RAZOR HANDLE
Wolfgang Hannemann, No. 47, Hansastrasse, 5650 Solingen 11, Fed. Rep. of Germany
Filed Apr. 25, 1983, Ser. No. 488,319
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 5 MR 9305
Term of patent 14 years
U.S. Cl. D28—48

279,614
SUCTION CLEANER OR THE LIKE
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Sep. 9, 1983, Ser. No. 530,494
Term of patent 14 years
U.S. Cl. D32—21



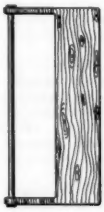
279,615
SUCTION CLEANER OR THE LIKE
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Sep. 9, 1983, Ser. No. 530,493
Term of patent 14 years
U.S. Cl. D32—21



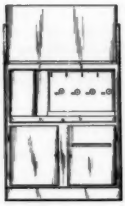
279,616
WALL MOUNTABLE BAG HOLDER
Ross Deacon, Syracuse, N.Y., assignor to Syroco, Inc., Syracuse, N.Y.
Filed Jun. 24, 1983, Ser. No. 507,570
Term of patent 14 years
U.S. Cl. D34—6

279,617
PALLET
Henry W. Helmer, 10 Colony Rd., Gretna, La. 70053
Filed Jan. 10, 1983, Ser. No. 457,043
Term of patent 14 years
U.S. Cl. D34—38

279,618
TOOL BOX
Thomas Walker, Apt. #6, 33 Poplar St., New Milford, Conn. 06776
Filed Sep. 30, 1982, Ser. No. 430,026
Term of patent 14 years
U.S. Cl. D34—44



279,619
POSTAL CENTER UNIT
Max L. Stevens, and William P. Goeckeler, both of St. Louis County, Mo., assignors to 24 Hour Postal Center, Inc., St. Louis, Mo.
Filed Dec. 6, 1982, Ser. No. 446,951
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JULY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Natterman & Cie. GmbH: *See—*
Ghyczy, Miklos; Erdos, Adorjan; Heidemann, Gunter; and Ritzmann, Gotz, 4,528,193, Cl. 514-78.000.

A. Nattermann GmbH & Coe KG: *See—*
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A. Schulman, Inc.: *See—*
Nelson, Wayne F., 4,528,123, Cl. 252-511.000.

AB Casco: *See—*
Gote, Helgesson; Bjorn, Mansson; and Nils-Hakan, Wallin, 4,528,309, Cl. 524-13.000.

AB Stil-Industri: *See—*
Sylven, Hans; Ennerdal, Leif; and Berg, Lars-Eije, 4,527,313, Cl. 24-464.000.

Abare Enterprises, Inc.: *See—*
Abare, Helena E., 4,527,566, Cl. 128-402.000.

Abare, Helena E., to Abare Enterprises, Inc. Body wrap. 4,527,566, Cl. 128-402.000.

Abbott Laboratories: *See—*
Chu, Daniel T., 4,528,285, Cl. 514-224.000.

Abbott, Vaughan; Morris, Nicholas G.; Lambert, Scott M.; and Letellier, Richard A., to Emhart Industries, Inc. Glass forming blank and plunger cooling. 4,528,015, Cl. 65-162.000.

Abbott, Vaughan; Beckwith, Bruce R.; Kingsbury, Charles M.; Mungovan, John P.; and Mills, Elden H., to Emhart Industries, Inc. Blank cylinder apparatus. 4,528,017, Cl. 65-240.000.

Abcor, Inc.: *See—*
Lee, Cheng H., 4,527,999, Cl. 55-16.000.

Abdunur, Charles S., to Etat Francais represente par le Ministere de l'Urganisme et du Logement Laboratoire Central des Ponts et Chaussees. Ultra-flat pressure plate material tester and method for its manufacture. 4,527,431, Cl. 73-803.000.

Abe, Fumiyoshi, to Sony Corporation. Drum servo control with reduced head phase error during editing. 4,528,603, Cl. 360-70.000.

Abe, Shigeya: *See—*
Ito, Teruyoshi; and Abe, Shigeya, 4,527,535, Cl. 123-617.000.

Abe, Tomoaki; Kinugawa, Masumi; and Hiromasa, Shunichiro, to Nippondenso Co., Ltd. Method for correcting a controlled variable for the control of the operation of an internal combustion engine on the basis of the quantity of suction air. 4,527,530, Cl. 123-494.000.

AccuRay Corporation: *See—*
Domin, Thomas M.; Landis, Dan R.; and Williams, Paul, 4,528,507, Cl. 324-229.000.

Acker, Roy M.: *See—*
Cartier, Francis R.; Stager, David N.; and Acker, Roy M., 4,527,619, Cl. 165-41.000.

ACR Process Corp.: *See—*
Walton, Eric K., 4,527,445, Cl. 74-625.000.

Adams, Don L.: *See—*
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; Verzella, David J.; and Sivigny, Arthur L., 4,528,628, Cl. 364-424.000.

Adams, George C., to Rollform, Inc. Door frame clip. 4,527,369, Cl. 52-211.000.

Addie, Graeme R., to GIW Industries, Inc. Pump adjustment assembly. 4,527,948, Cl. 415-128.000.

Advanced Micro Devices, Inc.: *See—*
Harvey, Barry, 4,528,465, Cl. 307-454.000.

AFA Corporation, The: *See—*
Garneau, Richard P., 4,527,594, Cl. 137-854.000.
Garneau, Richard P., 4,527,741, Cl. 239-333.000.

Agarwal, Paul D.; Fruechte, Roger D.; Kade, Alexander; and Radomski, Thomas A., to General Motors Corporation. Road load insensitive electric power steering system. 4,527,653, Cl. 180-79.100.

Agback, Karl H.; and Nygren, Alf S., to Pharmacia AB. Method and intermediates for preparing high purity 3,3'-azo-bis-(6-hydroxy benzoic acid). 4,528,367, Cl. 534-599.000.

Agency of Industrial Science and Technology: *See—*
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,528,118, Cl. 252-500.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,527,691, Cl. 206-387.000.

Agfa-Gevaert N.V.: *See—*
Deconinck, Hugo F., 4,527,320, Cl. 29-33.00R.

Agrawal, Bhagwati; and Shenol, Kishan, to International Telephone and Telegraph Corporation. Digital to analog converter employing sigma-delta modulation for use in telephone systems. 4,528,551, Cl. 340-347.0DA.

Ahad, Samir E.: *See—*
Cheng, Chao-Jan; Donak, John R.; and Ahad, Samir E., 4,528,664, Cl. 370-110.300.

Ahle, James L., to Stauffer Chemical Company. Enhancement of herbicidal activity of tetraaluminum salts of N-phosphonomethylglycine. 4,528,023, Cl. 71-86.000.

Ai, Daniel K.: *See—*
Yu, Ho; and Ai, Daniel K., 4,527,612, Cl. 164-428.000.

Ai, Hideo; Ikeda, Akihiko; and Matsuoka, Yoshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Epoxy compounds, process for the preparation thereof and resist materials comprising thereof. 4,528,332, Cl. 525-332.200.

Aiba, Akira: *See—*
Yoshimura, Tokuo; Hagiwara, Kunio; and Aiba, Akira, 4,528,304, Cl. 523-216.000.

Air Products and Chemicals, Inc.: *See—*
Kingston, Michael F. E., 4,527,718, Cl. 222-603.000.
Klee, David J., 4,527,844, Cl. 312-214.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Kondo, Hiroyuki; Yoshimura, Yoshikane; and Nomura, Yoshihisa, 4,527,709, Cl. 220-22.000.
Okabe, Yoshio, 4,527,462, Cl. 92-51.000.

Akasu, Masahira, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control system for internal combustion engine. 4,527,526, Cl. 123-425.000.

Akatsu, Yohsuke: *See—*
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,527,654, Cl. 180-140.000.

Aktieselkabet J.H. Holm Holding: *See—*
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Aladdin Equipment Company: *See—*
Combest, H. E. Buddy; and Tunks, Larry M., 4,527,429, Cl. 73-744.000.

Albarda, Scato, to Dragerwerk Aktiengesellschaft. Dosing pump for liquids. 4,527,463, Cl. 92-84.000.

Albers, Gerard P.: *See—*
Rutherford, David A.; and Albers, Gerard P., 4,527,928, Cl. 405-211.000.

Albert Einstein College of Medicine of Yeshiva University: *See—*
Heller, Sherman L., 4,528,453, Cl. 250-505.100.

Albert Nestler GmbH: *See—*
Heups, Gert, 4,527,340, Cl. 33-430.000.

Albrecht, Horst, to Heraeus Quarzschmelze GmbH. Crucible for semiconductor manufacturing purposes and a process for manufacturing the crucible. 4,528,163, Cl. 422-249.000.

Alcan Aluminum Corporation: *See—*
Elder, Danny S., 4,528,155, Cl. 264-174.000.

Alderman, Daniel A.; and Zweigle, Maurice L., to Dow Chemical Company, The. Sustained release compositions. 4,528,125, Cl. 252-522.00A.

Aleixo, Francisco H.: *See—*
Lasner, Jeffrey I.; and Aleixo, Francisco H., 4,527,331, Cl. 30-135.000.

Alfermann, Larry D.: *See—*
Tipton, Larry J.; and Alfermann, Larry D., 4,527,490, Cl. 108-111.000.

Alford, Neil M., to Imperial Chemical Industries PLC. Production of fibre-reinforced cementitious composition. 4,528,238, Cl. 428-246.000.

Algieri, Aldo A.: *See—*
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,528,375, Cl. 546-193.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,528,377, Cl. 546-209.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,528,378, Cl. 546-209.000.

Alig, Roger T., to RCA Corporation. Cathode-ray tube having electron gun with three focus lenses. 4,528,476, Cl. 313-412.000.

ALKEM GmbH: *See—*
Ledebrink, Friedrich-Wilhelm; Rosenkranz, Wolfgang; and Stoll, Wolfgang, 4,528,130, Cl. 252-643.000.

Allam, Farouk M. Drilling bit. 4,527,644, Cl. 175-333.000.

Allen, Adrian S.; and Flesher, Peter, to Allied Colloids Limited. Polymer dispersions and their preparation. 4,528,321, Cl. 524-761.000.

Allen, Richard C.: *See—*
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,528,376, Cl. 546-198.000.

Allen, Roy A., to Shell Oil Company. Process for preparing higher molecular weight epoxy resins. 4,528,356, Cl. 528-89.000.

Alley, James R.: *See—*
McGill, James C.; Alley, James R.; and Coombs, David W., 4,528,000, Cl. 55-2.00G.

Allied Colloids Limited: *See—*
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Allied Corporation: *See*—
Bisacquino, Lenora A.; Dienes, Larry E.; and Plasko, Rudolph J., 4,528,590, Cl. 338-153.000.
Cerny, Robert S., 4,527,522, Cl. 123-416.000.
Gaiser, Robert F.; and Lohraff, Larry G., 4,527,395, Cl. 60-562.000.
Gallusser, David O.; and Frear, David L., 4,527,851, Cl. 339-94.00M.
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Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,528,020, Cl. 71-28.000.
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Sacks, William: Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,528,235, Cl. 428-220.000.
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Alligood, John H., to Eastman Kodak Company. Camera loading door interlock. 4,527,873, Cl. 354-121.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L.; and Damiano, Victor V., 4,528,215, Cl. 427-252.000.

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Alpine Aktiengesellschaft Augsburg: *See*—
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Alps Electric Co., Ltd.: *See*—
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Aluminum Company of America: *See*—
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American Cyanamid Co.: *See*—
Beidler, Richard F.; and Ruby, Philip R., 4,528,395, Cl. 560-067.000.
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American Home Products Corporation: *See*—
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American Hospital Supply Corp.: *See*—
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American Seating Company: *See*—
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AMF Incorporated: *See*—
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Davis, Newton G., 4,527,451, Cl. 81-9.510.
Hughes, Donald W. K.; Metzger, Donald L.; and Reynolds, Charles E., 4,527,857, Cl. 339-258.00S.

Ampex Corporation: *See*—
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Anchor, Michael J.; and Camp, Ronald L., to BASF Wyandotte Corporation. Solubilization of benzylidene acetone in zinc electroplating baths. 4,528,075, Cl. 204-55.00R.

Andersen, Harold W.; and Harrison, Charles H., to H. W. Andersen Products Inc. Apparatus and method for testing the sufficiency of sterilization. 4,528,268, Cl. 435-31.000.

Andersen, James H. Combined switch and circuit breaker. 4,528,538, Cl. 337-43.000.

Anderson, Arthur H., to Bimax Controls, Inc. Check valve. 4,527,733, Cl. 236-41.000.

Anderson, John M.; and Johnson, Peter D., to General Electric Company. Use of amalgams in solenoidal electric field lamps. 4,528,209, Cl. 427-67.000.

Anderson, Lowell M.: *See*—
Greenheck, Donald W.; and Anderson, Lowell M., 4,527,400, Cl. 62-239.000.

Andersson, Bengt T., to Outokumpu Oy. Method for producing blister copper. 4,528,033, Cl. 75-73.000.

Andersson, Hans O. V.; Rundkvist, Kjell D.; and Samsioe, Per E., to Telefonaktiebolaget LM Ericsson. Electronic current interrupter included in a DC distribution system. 4,528,608, Cl. 361-18.000.

Andrae, Klaus: *See*—
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Andre' Gueissaz et Cie, S.A.: *See*—
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Andruchiw, Roman. Pole climbing aid. 4,527,660, Cl. 182-9.000.

Anne, Jean, to LCC.CICE-Compagnie Europeenne de Composants Electroniques. Process and device for placing electronic components in a case. 4,527,318, Cl. 29-25.420.

AO Medical Products AB: *See*—
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Aoki, Takaaki. Handy scissors. 4,527,332, Cl. 30-234.000.

Aoki, Yoshihiro. Magnetic retaining device for a belt. 4,527,311, Cl. 24-303.000.

Aono, Toshio. Mowing rotary sawtoothed cutter. 4,527,382, Cl. 56-295.000.

Aoun, Joseph, to Lettera Arabica S.a.r.l. Method for the composition of texts in Arabic letters and composition device. 4,527,919, Cl. 400-111.000.

Aoyama, Fumihiko; Murata, Kazushige; and Hayashi, Masahiro, to Inax Corporation. Method for obtaining drain-cast hollow articles for ceramic ware. 4,528,152, Cl. 264-87.000.

Apeldoorn, Hans J., to U.S. Philips Corporation. TV-IF Circuit. 4,528,592, Cl. 358-198.000.

Apollo Fire Detectors Limited: *See*—
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Arakawa, Kazuhiro, to Canon Kabushiki Kaisha. Liquid crystal display keyboard. 4,527,862, Cl. 350-334.000.

Araki, Kazuo: *See*—
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Arato, Gabor P., to Isolation Systems Limited. Method and apparatus for monitoring ground faults in isolated electrical systems. 4,528,497, Cl. 324-51.000.

Arcara, Samuel A., to Honeywell Inc. Method of measuring specific gravity and apparatus utilizing the same. 4,527,418, Cl. 73-30.000.

Archambeault, William J. Apparatus for counting articles traveling in a random pattern. 4,528,680, Cl. 377-6.000.

Archer, Danny, to VRP Partners, Ltd. Expandable support structure usable as loading ramp. 4,527,941, Cl. 414-537.000.

Arend, Gunter; Konigshofen, Heinrich; Muller, Peter; and Musch, Rudiger, to Bayer Aktiengesellschaft. Xanthogen disulphides. 4,528,388, Cl. 549-448.000.

Argo Systems, Inc.: *See*—
Miles, Thomas P.; and Koenen, Richard A., 4,528,567, Cl. 343-442.000.

Arikawa, Junichi: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,527,845, Cl. 312-215.000.

Arisi, Sergio, to Cise - Centro Informazioni Studi Esperienze S.p.A. Instrument unit for measuring temperatures and heat flux in evaporative walls of steam generators. 4,527,908, Cl. 374-147.000.

Armco, Inc.: *See*—
Scheel, John H., 4,527,776, Cl. 266-44.000.

Armour Pharmaceutical Company: *See*—
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,528,132, Cl. 260-112.50T.

Arms, Rondy. Garbage can rack. 4,527,695, Cl. 211-71.000.

Arndt, Raymond J., to Mactron, Inc. Apparatus for applying a coating to a moving surface. 4,527,510, Cl. 118-669.000.

Arnold, Mary T.; and Siciliano, George R., to Atlantic Richfield Company. Production of bis(alpha-alkylbenzyl)ethers. 4,528,406, Cl. 568-659.000.

Arther, Hugh M.; Preston, Edward G.; Stewart, David B.; and Wood, Godfrey A., to Molins plc. Producing filler material, particularly for cigarette filters. 4,528,050, Cl. 156-62.400.

Asahi Glass Company Ltd.: *See*—
Asawa, Tatsuro; Ishii, Tsuneji; and Gunjima, Tomoki, 4,528,058, Cl. 156-306.600.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Ai, Hideo; Ikeda, Akihiko; and Matsuoka, Yoshio, 4,528,332, Cl. 525-332.200.
Mitsui, Osamu; and Fukuoka, Yohei, 4,528,409, Cl. 568-835.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Sugawara, Saburo, 4,527,881, Cl. 354-432.000.

Asakawa, Yoshiaki: *See*—
Ichikawa, Akira; Komatsu, Akio; and Asakawa, Yoshiaki, 4,528,688, Cl. 381-43.000.

Asano, Hisashi, to Sony Corporation. Record player with automatic music search function. 4,528,653, Cl. 369-41.000.

Asawa, Tatsuro; Ishii, Tsuneji; and Gunjima, Tomoki, to Asahi Glass Company Ltd. Method of bonding ion exchange membrane of fluorinated polymer to synthetic resin. 4,528,058, Cl. 156-306.600.

Asberg, Sture, to SKF Nova AB. Means for mounting a hub bearing unit to a vehicle. 4,527,916, Cl. 384-513.000.

Asberg, Sture, to SKF Nova AB. Ball joint for suspension of wheels. 4,527,924, Cl. 403-76.000.

Aschwanden, Felix, to RCA Corporation. SECAM Modulator. 4,528,527, Cl. 332-19.000.

ASEA Aktiebolag: *See*—
Stenkvist, Sven-Einar, 4,528,673, Cl. 373-108.000.

Ashton, Richard F.: *See*—
Ward, Bennie R.; and Ashton, Richard F., 4,528,042, Cl. 148-11.50A.

Assandri, Alessandro: *See*—
Fontanella, Luigi; Martinelli, Edoardo; and Assandri, Alessandro, 4,528,297, Cl. 514-392.000.

Assell, Robert L.; and Skwor, Edward P., to Minnesota Mining and Manufacturing Company. Bone stapler. 4,527,726, Cl. 227-19.000.

Asten Group, Inc.: *See*—
Finn, William A.; and Searfass, Harry I., 4,528,236, Cl. 428-222.000.

AT&T Bell Laboratories: *See*—
Burrus, Charles A., Jr.; and Lin, Chinlon, 4,528,670, Cl. 372-44.000.
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,528,464, Cl. 307-425.000.

Fulcomer, Emanuel J., Jr., 4,528,681, Cl. 377-16.000.
Perry, Michael W., 4,528,615, Cl. 361-386.000.
AT&T Information Systems Inc.: *See—*
Grimes, Gary J., 4,528,521, Cl. 331-1.00A.
AT&T Technologies, Inc.: *See—*
Kent, William C.; and Payne, Charles H., 4,527,731, Cl. 228-180.200.
Atecs Corporation: *See—*
Grant, Richard W.; and Sciulli, Ronald D., 4,527,499, Cl. 114-39.000.
Atlantic Richfield Company: *See—*
Arnold, Mary T.; and Siciliano, George R., 4,528,406, Cl. 568-659.000.
Dean, Barry D., 4,528,326, Cl. 525-66.000.
Li, Ying H., 4,527,342, Cl. 34-10.000.
Motier, John, 4,527,581, Cl. 137-13.000.
Nguyen, Tinh; and Gaul, James M., 4,528,154, Cl. 264-109.000.
Roth, David J.; Culler, Lawrence R.; and Heifner, Ralph D., 4,527,779, Cl. 266-227.000.
Atsugi Motor Parts Co., Ltd.: *See—*
Emura, Junichi; Kanari, Issei; and Saito, Hideaki, 4,527,676, Cl. 188-299.000.
Audi Nsu Auto Union Aktiengesellschaft: *See—*
Hartlieb, Dieter, 4,527,936, Cl. 414-47.000.
Auer, Mark J. Manufacturing fiberboard ducts. 4,528,053, Cl. 156-204.000.
Augustin, Eugene P., to Boman Industries. Waveguide polarization coupling. 4,528,528, Cl. 333-21.00A.
Auinger, Herbert, to Siemens Aktiengesellschaft. Pole-changing three-phase winding for optional, fractional pole-pair ratios. 4,528,472, Cl. 310-198.000.
aus der Funten, Helmut; and Vogt, Wilhelm, to Dynamit Nobel AG. Method of preparing phthalide. 4,528,385, Cl. 549-307.000.
Ausnit, Steven, to Minigrip, Inc. Method of making multiple reclosable bag material. 4,528,224, Cl. 428-36.000.
Autoflug-Stakupress GmbH & Co.: *See—*
Straszewski, Klaus; Ender, Erhard; and Krutzfeldt, Herbert, 4,527,317, Cl. 24-641.000.
Automatik Apprate-Maschinenbau H. Hench GmbH: *See—*
Lettner, Horst H.; Hunke, Friedrich; and Hench, Hans, 4,528,157, Cl. 264-237.000.
Automotive Engine Associates: *See—*
Showalter, Merle R., 4,527,774, Cl. 251-337.000.
AVA International Corporation: *See—*
Vazquez, Gonzalo, 4,527,631, Cl. 166-322.000.
Avery International Corp.: *See—*
Hunt, Stuart B. D.; Chandler, Philip B.; and Harrison, Thomas L., 4,528,056, Cl. 156-253.000.
Avon Murdoch Limited: *See—*
Murdoch, George, 4,527,843, Cl. 312-31.200.
Axelson, Inc.: *See—*
Vanderburg, Ralph W., 4,527,770, Cl. 251-26.000.
Axionics, Inc.: *See—*
Calenoff, Emanuel; Tsay, Yuh-Geng; Jones, Ruth M.; and Scott, John R., 4,528,267, Cl. 435-7.000.
Ayata, Kenzo: *See—*
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; Miyazaki, Jun; Fujimoto, Takahiko; and Nakata, Hitoshi, 4,527,615, Cl. 164-468.000.
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, to Canon Kabushiki Kaisha. Image recording system having multiple image recording means. 4,527,885, Cl. 355-3.00R.
Ayliffe, Peter J.: *See—*
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,528,562, Cl. 340-805.000.
Ayoub, Peter; and Cantor, Alan, to United States of America, Navy. Deployment sequence mode selection system for aircraft ejection seat. 4,527,758, Cl. 244-150.000.
Baader, Bernd: *See—*
Geyer, Christoph; and Baader, Bernd, 4,528,570, Cl. 346-74.200.
Baatz, Henning; Ritscher, Dieter; and Wriegt, Jurgen, to GNS Gesellschaft fur Nuklear-Service mbH. Radiation-shielding transport and storage container. 4,528,454, Cl. 250-506.100.
Babb, Albert L., to Biomedics, Inc. Chemotherapeutic agent and tracer composition and use thereof. 4,528,178, Cl. 424-7.100.
Babcock & Wilcox Company, The: *See—*
White, Jack M., 4,527,434, Cl. 73-867.650.
Bacardit, Juan S., to Bendiberica S.A. Hydraulic rotary distributor with a star-shaped rotor, more particularly for a power-assisted steering mechanism. 4,527,591, Cl. 137-625.210.
Bacevius, Joseph G. Clamping device and article holder therefor. 4,528,622, Cl. 362-396.000.
Bachenheimer, Steven: *See—*
Heymann, Mark S.; and Bachenheimer, Steven, 4,527,707, Cl. 220-1.00R.
Badger, Philip O., to Miracle Metals, Inc. Method of mitigating boundary friction and wear in metal surfaces in sliding contacts. 4,528,079, Cl. 204-129.100.
Bahr, Richard G.; and Hogan, Thomas C., to Prime Computer, Inc. Ring communications system. 4,528,661, Cl. 370-86.000.
Baird, Billy C.: *See—*
Baird, William R.; and Baird, Billy C., 4,527,486, Cl. 105-215.00C.
Baird Corporation: *See—*
Gilles, Pieter; and Schmitt, Jean-Claude, 4,528,158, Cl. 422-63.000.
Baird, Richard H.; Blechar, Theodore J.; Giladett, Leo V. B.; Horner, Reginald M.; Prouty, Gerald G.; and Rinde, David L., to Electric Power Research Institute, Inc. Kinetically bonded tubes and tubesheet. 4,527,623, Cl. 165-173.000.
Baird, Truette H.: *See—*
Fullbright, Olen E.; Baird, Truette H.; and Wade, Jack H., 4,527,403, Cl. 66-177.000.
Baird, William R.; and Baird, Billy C., to Saturn Machine & Welding Co., Inc. Vehicle with selectively useable wheel sets. 4,527,486, Cl. 105-215.00C.
Bak, Claude; Bellocci, Rio; and Colmet, Serge, to Pont-A-Mousson S.A. Method for inoculating liquid metal cast under low pressure. 4,527,608, Cl. 164-58.100.
Baker, Steven F., to General Motors Corporation. Locking fuel cap. 4,527,406, Cl. 70-165.000.
Baker, Thomas J.: *See—*
Sweet, Richard H.; Baker, Thomas J.; Stickel, Erick E.; and Gauthier, Emile, 4,527,315, Cl. 24-615.000.
Baker, W. Barry; and Betsill, Harry E., to Du Pont de Nemours, E. I., and Company. Pump unit for sampling air. 4,527,953, Cl. 417-38.000.
Balazs nee Czurda, Marta: *See—*
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.
Balbo, Edoardo, to Ing. C. Olivetti & C., S.p.A. Ink-jet printer damping. 4,528,578, Cl. 346-140.00R.
Baicke-Durr Aktiengsellschaft: *See—*
Ruscheweyh, Hans, 4,527,903, Cl. 366-337.000.
Balde, Daniel; and Boutemy, Gerard E. M., to Produits Chimiques Ugine Kuhlmann. 2-(Or4-)amino-5-alkylthio-pyrimidine herbicides. 4,528,026, Cl. 71-92.000.
Baldi, Alfonso L.; and Damiano, Victor V., to Alloy Surfaces Company, Inc. Diffusion aluminizing of cobalt-base superalloys. 4,528,215, Cl. 427-252.000.
Bales, Michael E.; and Schmidt, Wallace E., to Maytag Company, The. Oven ventilating system. 4,527,542, Cl. 126-299.00D.
Barcza, Sandor, to Sandoz, Inc. Disilacyclohexane derivatives in antifertility agents. 4,528,191, Cl. 514-63.000.
Barnes, Albert L., to Eltech Systems Corporation. Metal borides, carbides, nitrides, silicides, oxide materials and their method of preparation. 4,528,119, Cl. 252-503.000.
Barnes, Lloyd L., Jr.: *See—*
Lawrence, John E.; and Barnes, Lloyd L., Jr., 4,528,063, Cl. 156-626.000.
Barnett, Ronald R., to General Motors Corporation. Seat belt sleeve. 4,527,835, Cl. 297-482.000.
Barozzi, Gian P.; and Horeschi, Giancarlo, to Tokyo Juki Industrial Co., Ltd. Feed roller device of typewriter. 4,527,922, Cl. 400-637.500.
Barras, Francois: *See—*
Ducournau, Alain; and Barras, Francois, 4,527,476, Cl. 101-352.000.
Barthell, Eduard: *See—*
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,528,350, Cl. 526-307.000.
Bartho, Istvan: *See—*
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.
Bartholet, Stephen J., to Odetics, Inc. Walking machine. 4,527,650, Cl. 180-8.600.
Bartolomucci, Francesco: *See—*
Parma, Giovanni; and Bartolomucci, Francesco, 4,527,739, Cl. 239-186.000.
Bartzick, Gunter; Buhne, Gerd; and Naydowski, Reinhard, to Hoesch Werke Aktiengesellschaft. Apparatus for connecting overlapping ends of a strapping band tensioned about a package. 4,527,379, Cl. 53-589.000.
Base Ten Systems, Inc.: *See—*
James, Rolland T.; and Chebra, Ronald J., 4,528,423, Cl. 179-5.00R.
BASF Aktiengesellschaft: *See—*
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,528,185, Cl. 424-81.000.
Schmidts, Kurt; and Schuett, Walter, 4,527,690, Cl. 206-387.000.
BASF Wyandotte Corporation: *See—*
Anchor, Michael J.; and Camp, Ronald L., 4,528,075, Cl. 204-55.00R.
Bastian Advanced Systems, Inc.: *See—*
Tipton, Larry J.; and Alfermann, Larry D., 4,527,490, Cl. 108-111.000.
Battista, Richard A.: *See—*
Smith, William E.; and Battista, Richard A., 4,528,407, Cl. 568-804.000.
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans J., to Bauer, Fritz; and Sohne oHG. Angle joint. 4,527,925, Cl. 403-143.000.
Bauer, Hans J.: *See—*
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans J., 4,527,925, Cl. 403-143.000.
Bauer, Hans-Peter: *See—*
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans J., 4,527,925, Cl. 403-143.000.
Baumann, Heinrich, to Robert Bosch GmbH. Positioning sensor. 4,528,471, Cl. 310-11.000.
Baumberg, Iosif. Pipe for elevating liquid, and device provided therewith. 4,527,956, Cl. 417-65.000.
Baus, Heinz G. Corner assembly of structural members. 4,527,364, Cl. 52-127.700.

Bausch & Lomb Incorporated: *See*—
Esmay, Edward N., 4,527,870, Cl. 350-523.000.

Baxter, William J. Smokestack emission control apparatus. 4,528,005, Cl. 55-178.000.

Bayer Aktiengesellschaft: *See*—
Arend, Gunter; Konigshofen, Heinrich; Muller, Peter; and Musch, Rudiger, 4,528,388, Cl. 549-448.000.
Bockmann, Walter; Bruhne, Friedrich; and Lipper, Karl-August, 4,528,146, Cl. 260-544.00D.
Brokmeier, Dieter, 4,528,302, Cl. 523-204.000.
Coiln, Reimer; and Mohrmann, Karl H., 4,528,379, Cl. 546-209.000.
Fuhr, Karl; and Freier, Hans-Joachim, 4,528,307, Cl. 523-440.000.
Lorenz, Otto; and Rose, Gerd, 4,528,323, Cl. 524-839.000.
Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, 4,527,746, Cl. 241-23.000.
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., 4,528,117, Cl. 252-312.000.
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,528,153, Cl. 264-109.000.

BBC Brown, Boveri & Company, Limited: *See*—
Prenner, Herbert; Ulrich, Urban; Voser, Max; and Zimmerli, Beat, 4,528,469, Cl. 310-59.000.

Bear Medical Systems, Inc.: *See*—
DeVries, Douglas F.; and Cohen, Arie, 4,527,557, Cl. 128-204.230.

Beard, Charles D.; Yamada, Akira; and Doddi, Namassivaya, to Iolab Corporation. Ultraviolet absorbing polymers comprising 2-hydroxy-5-acrylyloxyphenyl-2H-benzotriazoles. 4,528,311, Cl. 524-91.000.

Beaujean, Joseph M. E., to Bogey B.V. Dustproof case for an optical information tape including a clamping lens. 4,528,654, Cl. 369-100.000.

Becerra-Novoa, Jorge O.: *See*—
Martinez Vera, Enrique R.; and Becerra-Novoa, Jorge O., 4,528,030, Cl. 75-35.000.

Bechtel National Corp.: *See*—
Dickinson, Ben W. O., III; Dickinson, Robert W.; and Hutchison, Stanley O., 4,527,639, Cl. 175-61.000.

Becker, Joseph J.; Luborsky, Fred E.; Jacobs, Israel S.; and McCary, Richard O., to General Electric Company. Treatment of amorphous magnetic alloys to produce a wide range of magnetic properties. 4,528,481, Cl. 315-248.000.

Becker, Reinhold; and Sattler, Helmut, to Hoechst Aktiengesellschaft. Device for conveying a flexible tubing and a fluid medium contained therein. 4,527,505, Cl. 118-44.000.

Becker, Robert O. Processes and products involving cell modification. 4,528,265, Cl. 435-172.100.

Beckwith, Bruce R.: *See*—
Abbott, Vaughan; Beckwith, Bruce R.; Kingsbury, Charles M.; Mungovan, John P.; and Mills, Elden H., 4,528,017, Cl. 65-240.000.

Becton, Dickinson and Company: *See*—
Burns, James A., 4,527,561, Cl. 128-314.000.

Bedell, John R.; and Rosenthal, Eli, to Electric Power Research Institute. Method and apparatus for slitting a continuously cast metal ribbon. 4,527,613, Cl. 164-463.000.

Beer, Henri B.; and Hinden, Jean M., to ELTECH Systems Corporation. Electrode with electrocatalytic surface. 4,528,084, Cl. 204-290.00F.

Beever, William H.: *See*—
Selby, Larry M.; and Beever, William H., 4,528,335, Cl. 525-420.000.

Behar, Salamon: *See*—
Fischler, Henryk; Krupka, Yaakov; and Behar, Salamon, 4,527,567, Cl. 128-419.0PT.

Behr, R. Douglas: *See*—
Fisher, Julie M.; Tumminia, Dennis R.; and Behr, R. Douglas, 4,527,314, Cl. 24-587.000.

Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, to Olympia Werke AG. Optical print head with removable mounting. 4,528,573, Cl. 346-108.000.

Behringer, Wolfgang; Stockl, Klaus; and Weiland, Rolf-Juergen, to Siemens Aktiengesellschaft. Dentist chair. 4,527,976, Cl. 433-33.000.

Beidler, Richard F.; and Ruby, Philip R., to American Cyanamid Co. Process for esterifying 3,5-di-tert-butyl-4-hydroxybenzoic acid. 4,528,395, Cl. 560-067.000.

Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, to DSM Resins B.V. Polyester and its use in powder coating. 4,528,341, Cl. 525-438.000.

Bellamy, Francois: *See*—
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,528,294, Cl. 514-327.000.

Bellocci, Rio: *See*—
Bak, Claude; Bellocci, Rio; and Colmet, Serge, 4,527,608, Cl. 164-58.100.

Bendiberica S.A.: *See*—
Bacardit, Juan S., 4,527,591, Cl. 137-625.210.

Benson, Inc.: *See*—
Doggett, David E., 4,528,448, Cl. 250-231.0SE.

Berchem, Rutger, to Berchem & Schaberg GmbH. Sprocket wheel and method of making same. 4,527,987, Cl. 474-152.000.

Berchem & Schaberg GmbH: *See*—
Berchem, Rutger, 4,527,987, Cl. 474-152.000.

Berg, Lars-Eije: *See*—
Sylven, Hans; Ennerdal, Leif; and Berg, Lars-Eije, 4,527,313, Cl. 24-464.000.

Bergdahl, Herbert O., Jr. Sharpener for turning tools. 4,527,361, Cl. 51-239.000.

Bergermann, Franz; and Prufer, Michael, to Triumpf-Adler A.G. fur Buro und Informationstechnik. Method of cursor control for enabling all text in wor'.ng memory to be displayed well in advance of reproduction of editing. 4,528,560, Cl. 340-709.000.

Berkoh Company, Inc.: *See*—
Kohls, John B., 4,527,905, Cl. 368-93.000.

Berman, Jody R.; Bertram, James L.; and Whiteside, Ross C., Jr., to Dow Chemical Company, The. Adducts of epoxy resins and amino-substituted aromatic sulfonic acid amides. 4,528,359, Cl. 528-109.000.

Bert, Alain, to Thomson-CSF. Hyperfrequency power oscillator. 4,528,524, Cl. 331-56.000.

Bertels, Augustinus W. M., to Nagron Steel and Aluminium B.V. Solar energy system and solar heat collector. 4,527,545, Cl. 126-433.000.

Bertkau, Geoffrey H.: *See*—
Mizerak, Robert J.; Bertkau, Geoffrey H.; Line, William F.; and Chicoye, Etzer, 4,528,198, Cl. 426-16.000.

Bertram, James L.: *See*—
Berman, Jody R.; Bertram, James L.; and Whiteside, Ross C., Jr., 4,528,359, Cl. 528-109.000.

Beta Corporation of St. Louis: *See*—
Volk, Joseph A., Jr., 4,528,489, Cl. 318-480.000.

Betsill, Harry E.: *See*—
Baker, W. Barry; and Betsill, Harry E., 4,527,953, Cl. 417-38.000.

Beyer, Klaus D.; and Silvestri, Victor J., to International Business Machines Corporation. Method for forming a void free isolation structure utilizing etch and refill techniques. 4,528,047, Cl. 148-175.000.

Bhagat, Jayant K., to General Motors Corporation. Silicon nitride formation and use in self-aligned semiconductor device manufacturing method. 4,528,211, Cl. 427-88.000.

Bharteey, Brij M.: *See*—
Shariff, Sadiq A.; Bharteey, Brij M.; and Mehkri, Shahab A., 4,528,614, Cl. 361-379.000.

Bich, Rene , to Societe J.G. Allinquant. Piston locking for gas springs. 4,527,780, Cl. 267-64.120.

Biddle, Richard A.; and Sutton, Ernest S., to Thiokol Corporation. Highly soluble, non-hazardous hydroxylammonium salt solutions for use in hybrid rocket motors. 4,527,389, Cl. 60-207.000.

Biela, John A.: *See*—
Ettlinger, Ralph; and Biela, John A., 4,527,743, Cl. 239-530.000.

Bienick, Richard H.: *See*—
Middleton, Jerry L.; and Bienick, Richard H., 4,527,601, Cl. 141-348.000.

Biery Cheese Company: *See*—
Biery, Dennis H., 4,527,940, Cl. 414-416.000.

Biery, Dennis H., to Biery Cheese Company. Cheese unloading machine. 4,527,940, Cl. 414-416.000.

Big Jon, Inc.: *See*—
Emory, John E., Jr., 4,527,349, Cl. 43-21.200.

Billon-Pierron, Claude; Chavand, Jean; and Peccoud, Michel, to Commissariat A L'Energie Atomique. Wire cutting process and apparatus. 4,528,435, Cl. 219-69.00M.

Bimax Controls, Inc.: *See*—
Anderson, Arthur H., 4,527,733, Cl. 236-41.000.

Bimber, Russell M.: *See*—
Cryberg, Richard L.; and Bimber, Russell M., 4,528,400, Cl. 568-314.000.

Bingham, Wallace K., to Minnesota Mining and Manufacturing Company. Threads for identification of garments. 4,527,383, Cl. 57-200.000.

Biomedics, Inc.: *See*—
Babb, Albert L., 4,528,178, Cl. 424-7.100.

Bird, George E.: *See*—
Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., 4,527,745, Cl. 239-600.000.

Bisacquino, Lenora A.; Dienes, Larry E.; and Plasko, Rudolph J., to Allied Corporation. Electronic treadle. 4,528,590, Cl. 338-153.000.

Biscomb, Lioyd I. Wind motor. 4,527,950, Cl. 416-117.000.

Bitsch, Hans-Ulrich. Picture-screen work-station lamp. 4,528,618, Cl. 362-33.000.

Bixler, Craig A.: *See*—
McKee, Kenneth E.; Meitl, Harold G.; Thanh, Vo V.; and Bixler, Craig A., 4,527,444, Cl. 74-493.000.

Bjorn, Mansson: *See*—
Gote, Helgesson; Bjorn, Mansson; and Nils-Hakan, Wallin, 4,528,309, Cl. 524-13.000.

Blach, Josef A.; and Stade, Kurt. Processing shaft for machines for extruding, kneading, dispersing, mixing or homogenizing, in particular, plastics materials. 4,527,899, Cl. 366-79.000.

Black & Decker Inc.: *See*—
van Hauten, Hartmut, 4,527,453, Cl. 83-467.00R.

Blackburn, George L., to KabiVitrum AB. Controlled triglyceride nutrition for hypercatabolic mammals. 4,528,197, Cl. 514-552.000.

Blackington, Paul A., to Sheltered Workshop for the Disabled, Inc. Light distribution apparatus. 4,528,617, Cl. 362-32.000.

Blackman, William C.: *See*—
Jones, Herman S.; and Blackman, William C., 4,527,334, Cl. 33-138.000.

Blackwell, Jennings P., to Phillips Petroleum Company. Glass-filled polyarylene sulfide compositions containing organosilanes. 4,528,310, Cl. 524-86.000.

Blair, Gary S.: *See*—
McLaughlin, Stephen J.; Harville, John D.; and Blair, Gary S., 4,527,914, Cl. 384-428.000.

Blaseck, Klaus, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Remotely-controlled manipulator carrier system for a large-area cell of a nuclear facility. 4,527,934, Cl. 414-4.000.

Blechar, Theodore J.: *See*—
Baird, Richard H.; Blechar, Theodore J.; Giladett, Leo V. B.; Horner, Reginald M.; Prouty, Gerald G.; and Rinde, David L., 4,527,623, Cl. 165-173.000.

Blem, Allen R.; and McGuinness, James A., to Uniroyal, Inc. Defoliating composition. 4,528,022, Cl. 71-73.000.

Blewitt, Donald D.; and Vojnovich, Theodore, to Westinghouse Electric Corp. High voltage fuse with controlled arc voltage. 4,528,536, Cl. 337-5.000.

Blewitt, Donald D.; and Gupta, Tapan K., to Westinghouse Electric Corp. High current zinc oxide fuse. 4,528,537, Cl. 337-5.000.

Block, Charles; and Mintz, Leon, to Joseph Galkin Corporation. Belt loop setting system. 4,527,491, Cl. 112-104.000.

Block, Norman L.: *See*—
Eckstein, Eugene C.; Block, Norman L.; Kline, Jacob; and Pinchuk, Leonard, 4,527,293, Cl. 623-12.000.

Block, Robert S.; and Martin, John R., to Telease, Inc. Method and system for subscription television billing and access. 4,528,589, Cl. 358-122.000.

Bloom Engineering Company, Inc.: *See*—
Morgan, John W., II; and Klein, Thomas E., 4,528,672, Cl. 373-75.000.

Bloomer, Milton D., to General Electric Company. Reverse-phase-control power switching circuit and method. 4,528,494, Cl. 323-237.000.

Blosser, Virgil Y.: *See*—
Singh, Anand P.; Blosser, Virgil Y.; and Crumbacher, Thomas A., 4,527,946, Cl. 425-42.000.

BOC Group, Inc., The: *See*—
Hoenig, Richard, 4,527,558, Cl. 128-205.240.

Bock, Jan: *See*—
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,528,348, Cl. 526-225.000.

Bockmann, Walter; Bruhne, Friedrich; and Lipper, Karl-August, to Bayer Aktiengesellschaft. Process for the preparation of terephthaloyl and isophthaloyl dichlorides. 4,528,146, Cl. 260-544.00D.

Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. 1-Hydroxymethyl-2-acyl cyclopropane derivatives and esters thereof. 4,528,142, Cl. 260-463.000.

Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, to International Flavors & Fragrances Inc. Hydrocarbyloxy alkanal. 4,528,402, Cl. 568-445.000.

Bodine, Albert G. Cycloidal drill bit. 4,527,637, Cl. 175-55.000.

Boehne, Dale: *See*—
Stump, Lee E.; David, Eugene C.; and Boehne, Dale, 4,527,359, Cl. 51-138.000.

Boeing Company, The: *See*—
Flaig, Terrance L.; and Peterson, Gavrik, 4,528,486, Cl. 318-254.000.

Bogey B.V.: *See*—
Beaujean, Joseph M. E., 4,528,654, Cl. 369-100.000.

Bogner, Bruce F.: *See*—
Nelson, Jordan R.; and Bogner, Bruce F., 4,528,213, Cl. 427-105.000.

Bogucki-Land, Bogdan, to Karl Mayer Testilmaschinenfabrik GmbH. Process for the control of warping speed and a direct warping machine for carrying out this process. 4,528,631, Cl. 364-470.000.

Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., to Firestone Tire & Rubber Company, The. Sealant compositions having, as an essential component, hydrogenated polybutadiene as network polymer. 4,528,331, Cl. 525-313.000.

Bolger, Thomas V., to RCA Corporation. Television receiver having picture magnifying apparatus. 4,528,585, Cl. 358-22.000.

Bolt, William S.; and Wood, Kenneth W. Suspendable hanger framework assembly. 4,527,694, Cl. 211-46.000.

Boman Industries: *See*—
Augustin, Eugene P., 4,528,528, Cl. 333-21.00A.

Bonazoli, Robert P.; and Shaffer, John W., to GTE Products Corporation. Circuit breaker by-pass element. 4,528,479, Cl. 315-73.000.

Book Covers Inc.: *See*—
Carter, Leewood C.; and Neary, Robin P., 4,527,814, Cl. 281-31.000.

Booth, Jerry N. Trolling control for boats. 4,527,982, Cl. 440-7.000.

Bordon, Ernesto E., to Schlumberger Technology Corporation. Single-wire selective perforation system having firing safeguards. 4,527,636, Cl. 175-4.550.

Borman, August H., to General Motors Corporation. Control valving for a variable capacity pump. 4,527,958, Cl. 417-213.000.

Borodin, Daniel J., to U.S. Automation Company. Cam-actuated robotic manipulator system. 4,527,446, Cl. 74-828.000.

Borovcova, Zelmira: *See*—
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.

Borsig GmbH: *See*—
Nassauer, Konrad, 4,527,761, Cl. 248-128.000.

Bostick, Hoyt A.; and Buczek, Carl J., to Ford Aerospace & Communications Corporation. Combined AM/FM laser radar·transmitter. 4,528,669, Cl. 372-26.000.

Bottcher, Irmgard: *See*—
Niedballa, Ulrich; and Bottcher, Irmgard, 4,528,298, Cl. 514-398.000.

Bottcher, Rolf; Heise, Rolf; and Praxator, Helmut, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Monitoring device for monitoring book block formation. 4,527,793, Cl. 271-263.000.

Boucherie, Leonel P., to G. B. Boucherie, Firma. Arrangement for filling cassettes with fibres. 4,527,838, Cl. 300-7.000.

Boutemy, Gerard E. M.: *See*—
Balde, Daniel; and Boutemy, Gerard E. M., 4,528,026, Cl. 71-92.000.

Bowman, Harold L., to White River Technologies, Inc. Pressure responsive hopper level detector system. 4,527,714, Cl. 222-56.000.

Bowman, Roger; Peach, Robert C.; and Milverton, David R. J., to Marconi Company, Limited, The. Acousto-optic transducer. 4,527,866, Cl. 350-358.000.

Boyd, John H., Jr., to General Electric Company. Electronically commutated motor, method of operating such, control circuit, laundry machine and drive therefor. 4,528,485, Cl. 318-138.000.

Boyden, James H., to Hewlett-Packard Company. Apparatus for reducing erosion due to cavitation in ink jet printers. 4,528,574, Cl. 346-140.00R.

Boyer, Ernest W.: *See*—
Hastings, Ray D.; and Boyer, Ernest W., 4,528,553, Cl. 340-526.000.

Braginetz, Paul A., to Fishburne, B. P., Jr.; and Wilson, Marlin G. Deck board anchor bracket. 4,527,375, Cl. 52-712.000.

Bragulla, Siegfried, to Henkel Kommanditgesellschaft auf Aktien. Method of using alkyl monophosphoric acids as germicidal agents. 4,528,110, Cl. 252-106.000.

Braun, Kenneth E., to Helwig Carbon, Inc. Brush wear indicator. 4,528,557, Cl. 340-648.000.

Braun, Ronald C.: *See*—
Collora, George A.; and Braun, Ronald C., 4,527,783, Cl. 269-21.000.

Bredal, Torben, to Aktieselkabet J.H. Holm Holding. Method for forming an internal thread in a hollow body. 4,527,299, Cl. 10-152.00R.

Breitling, Wolfram, to Robert Bosch GmbH. Electronic control apparatus with defined reset function. 4,528,629, Cl. 364-431.110.

Brennan, Dean C., to D. C. Brennan Firearms, Inc. Gun barrel. 4,527,348, Cl. 42-76.00R.

Brescia, Riccardo, to Ing. C. Olivetti & C., S.p.A. Ink-jet printer damping. 4,528,579, Cl. 346-140.00R.

Bresie, Don A.; Burns, Jack M.; Fowler, Donald W.; and Sheets, Marion S. Safety coupling arrangement. 4,527,816, Cl. 285-81.000.

Bresson, Clarence R.: *See*—
Kimble, Kenneth B.; and Bresson, Clarence R., 4,528,141, Cl. 260-455.00B.

Bridgeport Metal Goods Manufacturing Co., The: *See*—
Vasas, Martin M., 4,527,575, Cl. 132-88.700.

Bridgestone Tire Company Limited: *See*—
Kita, Toshio; Ikeda, Nobumasa; Takusagawa, Takashi; Goto, Yoshiharu; Hayakawa, Hiroshi; and Togashi, Minoru, 4,527,606, Cl. 152-209.00R.
Yoshizawa, Toshikazu; and Fujita, Takafumi, 4,527,365, Cl. 52-67.000.

Bridgewater, Bobbie D.; and Young, Robert E., to General Motors Corporation. Resilient anti-backlash shaft coupling. 4,527,986, Cl. 464-73.000.

Brisken, Axel F.: *See*—
Horner, Michael S.; Brisken, Axel F.; and Zanelli, Claudio I., 4,528,652, Cl. 367-162.000.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,528,375, Cl. 546-193.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,528,377, Cl. 546-209.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,528,378, Cl. 546-209.000.

British Petroleum Company p.l.c., The: *See*—
Wilson, Douglas, 4,528,342, Cl. 525-463.000.

Brock, Gregory K.; and Knowlen, Bruce R., to Weyerhaeuser Company. Method and apparatus for measurement of length and height of objects. 4,528,651, Cl. 367-99.000.

Brokmeier, Dieter, to Bayer Aktiengesellschaft. Mouldings and the production thereof comprising cement reinforced with pan fibers containing Zr. 4,528,302, Cl. 523-204.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Gotoh, Hideo; Fukao, Satoshi; and Suzuki, Makoto, 4,528,428, Cl. 200-5.00A.
Tazawa, Souichi, 4,527,498, Cl. 112-323.000.
Ueno, Hideo, 4,527,917, Cl. 400-70.000.
Yamamoto, Takemi; and Suzuki, Makoto, 4,527,918, Cl. 400-82.000.

Brown, Larry T.: *See*—
Pierce, Stanley L.; Brown, Larry T.; and Jain, Pramod K., 4,527,678, Cl. 192-3.580.

Brown & Williamson Tobacco Corporation: *See*—
Luke, John A., 4,527,572, Cl. 131-336.000.
Porenski, Harry S.; and Sullivan, James W., 4,527,570, Cl. 131-94.000.

Bruff, William; de Santana, Geraldo S.; and de Oliveira, David G., to Carboindustrial S.A.; and Elkem a/s. Process for the manufacture "in situ" of carbon electrodes. 4,527,329, Cl. 29-825.000.

Bruhne, Friedrich: *See*—
Bockmann, Walter; Bruhne, Friedrich; and Lipper, Karl-August, 4,528,146, Cl. 260-544.00D.

Brunner, Hubert: *See*—
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,527,691, Cl. 206-387.000.

Bruns, Klaus; and Dang, Thuy N., to Henkel Kommanditgesellschaft auf Aktien. 2,4-Dioxa-7,10-methano-spiro [5,5] undecanes and their use in perfumery compositions. 4,528,126, Cl. 252-522.00R.
Brunson, Amber N., to Brunson Instrument Company. Three dimension target. 4,527,339, Cl. 33-293.000.
Brunson Instrument Company: *See*—
Brunson, Amber N., 4,527,339, Cl. 33-293.000.
Brunswick Corporation: *See*—
Staerzl, Richard E., 4,528,460, Cl. 307-95.000.
Bubb, Jerome D.: *See*—
Eggeman, Vincent A.; Bubb, Jerome D.; Siegel, Harvey R.; and Wichman, Francis H., 4,527,684, Cl. 192-130.000.
Bucher, Bernard P.: *See*—
Lacour, Alain P.; Langlois, Michel; Jalfre, Maurice F.; and Bucher, Bernard P., 4,528,380, Cl. 548-250.000.
Bucherre, Veronique. Water harvesting and storage system. 4,527,927, Cl. 405-53.000.
Buckle, Brian L.; and Heesom, Neil C., to Buoyco (Divers) Limited. Depth responsive gas control device. 4,527,582, Cl. 137-81.200.
Buczek, Carl J.: *See*—
Bostick, Hoyt A.; and Buczek, Carl J., 4,528,669, Cl. 372-26.000.
Budrean, John D.; and Kirkpatrick, John A., to Verson Allsteel Press Company. Apparatus for drawing heavy wall shells with a multi-step inside edge. 4,527,413, Cl. 72-349.000.
Buhne, Gerd: *See*—
Bartzick, Gunter; Buhne, Gerd; and Naydowski, Reinhard, 4,527,379, Cl. 53-589.000.
Buoyco (Divers) Limited: *See*—
Buckle, Brian L.; and Heesom, Neil C., 4,527,582, Cl. 137-81.200.
Burco-Dean Limited: *See*—
Kay, Arthur S., 4,527,539, Cl. 126-39.00R.
Burke, Dennis J.; and Moore, Robert D., to Illinois Water Treatment Company. Method of separating acid from salt by adsorption with recycling. 4,528,101, Cl. 210-656.000.
Burkhardt, Gisbert, to Licentia-Patent-Verwaltungs GmbH. Apparatus for changing the direction of motion of letters and similar rectangular pieces of mail. 4,527,792, Cl. 271-225.000.
Burlington Industries, Inc.: *See*—
Gamblin, Rodger L., 4,528,070, Cl. 204-11.000.
Burnett, Jesse W.; and Hall, Homer H., to General Electric Company. Electrical brazing anti-arcing control circuit. 4,528,437, Cl. 219-85.0CA.
Burns, Gary D.; Mackenthun, Donald W.; and Schaber, Scott D., to Sperry Corporation. Gray code counter with error detector in a memory system. 4,528,665, Cl. 371-51.000.
Burns, Jack M.: *See*—
Bresie, Don A.; Burns, Jack M.; Fowler, Donald W.; and Sheets, Marion S., 4,527,816, Cl. 285-81.000.
Burns, James A., to Becton, Dickinson and Company. Automatic retractable lancet assembly. 4,527,561, Cl. 128-314.000.
Burr-Brown Corporation: *See*—
Smith, Robert E., 4,528,443, Cl. 235-462.000.
Burrington, George C.: *See*—
Jurkovic, Paul J.; and Burrington, George C., 4,527,414, Cl. 72-402.000.
Burroughs Corp.: *See*—
Chamberlain, John T., 4,528,647, Cl. 365-230.000.
Rinker, Larry C., 4,527,847, Cl. 339-5.00R.
Burrows, James L., to United States of America, Air Force. Variable radix processor. 4,528,641, Cl. 364-757.000.
Burrus, Charles A., Jr.; and Lin, Chinlon, to AT&T Bell Laboratories. Short coupled cavity laser. 4,528,670, Cl. 372-44.000.
Burwasser, Herman, to Transcopy, Inc. Ink jet recording transparency. 4,528,242, Cl. 428-413.000.
Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., to Spraying Systems Co. Quick disconnect fluid transfer system. 4,527,745, Cl. 239-600.000.
Byerley, Arlie. Safety device to quickly locate a drowning victim. 4,527,504, Cl. 116-211.000.
Byrne, James J. Filtering system for potable water. 4,528,095, Cl. 210-206.000.
Cabato, Nellie L.: *See*—
Stetson, Harold W.; and Cabato, Nellie L., 4,528,613, Cl. 361-321.000.
Cada, Frantisek: *See*—
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.
Cady, Susan M.: *See*—
Ley, David A.; and Cady, Susan M., 4,528,320, Cl. 524-555.000.
Caferro, Dennis. Self-contained oven. 4,527,538, Cl. 126-21.00R.
Cairns, James A.; and Ziegler, James F., to International Business Machines Corporation; and United Kingdom Atomic Energy Authority. Coated ceramic substrates for mounting integrated circuits. 4,528,212, Cl. 427-96.000.
Calenoff, Emanuel; Tsay, Yuh-Geng; Jones, Ruth M.; and Scott, John R., to Axionics, Inc. Fluorometirc enzyme inhibition immunoassay for measuring potency of allergen extracts. 4,528,267, Cl. 435-7.000.
Calgon Carbon Corporation: *See*—
Sutt, Robert F., Jr., 4,528,281, Cl. 502-402.000.
Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., to Standard Oil Company (Ohio), The. Method for the preparation of unsaturated carboxylic acid with high activity phosphomolybdic acid based catalysts. 4,528,398, Cl. 562-534.000.
Cambell, Thomas C.; Sherry, Howard S.; Schweiker, George C.; Falcone, James S., Jr.; and Sams, Robert H., deceased (by Sams, Ruth W., Legal Representative), to PQ Corporation. Zeolite ion exchanger for builders in detergents. 4,528,276, Cl. 502-62.000.
Camco, Incorporated: *See*—
Pringle, Ronald E., 4,527,630, Cl. 166-321.000.
Camp, Ronald L.: *See*—
Anchor, Michael J.; and Camp, Ronald L., 4,528,075, Cl. 204-55.00R.
Campau, Daniel N. Apparatus and system for filling one or more containers with a liquid to a predetermined level. 4,527,593, Cl. 137-805.000.
Campbell, Curtis B., to Chevron Research Company. Deposit control additives - hydroxy polyether polyamines. 4,527,996, Cl. 44-72.000.
Campsmith, John G.: *See*—
Felter, John V.; and Campsmith, John G., 4,528,569, Cl. 343-840.000.
Canfield, Douglas M.; and Casso-Solar Corporation. Glass sheet treating furnace with a roller conveyor. 4,528,016, Cl. 65-163.000.
Cangiano, Frank: *See*—
Dolan, Richard J.; Cangiano, Frank; and Van der Linde, John, 4,528,619, Cl. 362-61.000.
Canon Kabushiki Kaisha: *See*—
Arakawa, Kazuhiro, 4,527,862, Cl. 350-334.000.
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,527,885, Cl. 355-3.00R.
Hosoe, Kazuya; and Kinoshita, Takao, 4,527,879, Cl. 354-400.000.
Inoue, Takahiro; Hirayama, Kazuhiro; and Tsukada, Masaharu, 4,528,580, Cl. 346-160.000.
Kitamura, Takashi, 4,528,561, Cl. 340-745.000.
Koumura, Noboru; Mitzusawa, Nobutoshi; and Ozawa, Kunitaka, 4,528,576, Cl. 346-140.00R.
Okino, Tadashi, 4,527,880, Cl. 354-403.000.
Takahashi, Sadatoshi; and Tateoka, Masamichi, 4,527,858, Cl. 350-6.800.
Cantor, Alan: *See*—
Ayoub, Peter; and Cantor, Alan, 4,527,758, Cl. 244-150.000.
Cantu, Lisa A.; Yost, Marvin E.; Coffee, Robert L.; and Stolhand, James E., to Conoco Inc. Process and apparatus for removing dissolved oxygen. 4,527,626, Cl. 166-275.000.
Car Fresh Manufacturing Company, Inc.: *See*—
Ingram, James L., 4,527,713, Cl. 222-2.000.
Carboindustrial S.A.: *See*—
Bruff, William; de Santana, Geraldo S.; and de Oliveira, David G., 4,527,329, Cl. 29-825.000.
Cargill, Incorporated: *See*—
Haas, Louis M.; Williams, Joy L.; and Smith, Boyd E., 4,527,716, Cl. 222-83.500.
Carl Schenck AG: *See*—
Scharmer, Wolfgang; Saettler, Heinz; and Schlag, Eugen, 4,527,747, Cl. 241-26.000.
Carling, William R.: *See*—
Preston, John; and Carling, William R., 4,528,282, Cl. 514-19.000.
Carlsson, Halvard I. Machine for producing ice-cream. 4,527,972, Cl. 425-440.000.
Carp, Gerald, to United States of America, Transportation. Means for the deactivation of electric blasting caps. 4,527,480, Cl. 102-202.100.
Carraroli, Dario; and Giavelli, Giordano. Ceramic roller-hearth kiln with controlled combustion and cooling. 4,527,974, Cl. 432-78.000.
Carrier Corporation: *See*—
Clark, William E., 4,527,735, Cl. 236-87.000.
Duell, Richard J., 4,527,762, Cl. 248-222.100.
Kirtland, Howard W., 4,527,949, Cl. 415-150.000.
Lord, Richard G., 4,527,399, Cl. 62-212.000.
Seal, Douglas T.; and Haynes, Charles A., 4,528,441, Cl. 219-532.000.
Swain, Roy E.; and Clark, William E., 4,527,734, Cl. 236-49.000.
Carter, Clyde T., to Sealectro Corp. Zero insertion force socket. 4,527,850, Cl. 339-75.00M.
Carter, James H.; Ledis, Stephen L.; Crews, Harold R.; Sena, Ted; and Larsen, Fred L., to Coulter Electronics, Inc. Multi-purpose blood diluent and lysing agent for differential determination of lymphoid-myeloid population of leukocytes. 4,528,274, Cl. 436-10.000.
Carter, Leewood C.; and Neary, Robin P., to Book Covers Inc. Protective cover for books. 4,527,814, Cl. 281-31.000.
Cartier, Francis R.; Stager, David N.; and Acker, Roy M., to United States of America, Army. Exoatmospheric calibration sphere. 4,527,619, Cl. 165-41.000.
Casagrande, Cesare: *See*—
Vecchietti, Vittorio; Ferrari, Giorgio; and Casagrande, Cesare, 4,528,296, Cl. 514-346.000.
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., to Imperial Chemical Industries, PLC. Zeolite and process for preparing the same. 4,528,171, Cl. 423-277.000.
Case, William E.: *See*—
Eden, Dayton D.; and Case, William E., 4,528,525, Cl. 332-7.510.
Casso-Solar Corporation: *See*—
Canfield, Douglas M.; and Casso-Solar Corporation, 4,528,016, Cl. 65-163.000.
Cast-Tec Ltd.: *See*—
Clark, Antony P., 4,527,611, Cl. 164-329.000.
Cataler Industrical Co. Ltd.: *See*—
Suzuki, Yoshihiro; Kinoshita, Hiroo; Sato, Masayasu; and Ohara, Masanori, 4,528,279, Cl. 502-200.000.
Catani, Paolo, to ITALCEMENTI Fabbriche Riunite Cemento S.p.A. Tubular mill for grinding natural and synthetic raw materials, particularly for the cement industry. 4,527,748, Cl. 241-57.000.

Caterpillar Tractor Co.: *See—*
Martin, James L., 4,527,738, Cl. 239-90.000.

Cebal: *See—*
Jupin, Alain; and Schneider, Bernard, 4,527,700, Cl. 215-32.000.

Centre National de la Recherche Scientifique: *See—*
Le Goff, Pierre Y. J., 4,527,621, Cl. 165-104.120.

Cerberus AG: *See—*
Yasukawa, Makoto; and Ishii, Kenji, 4,528,555, Cl. 340-630.000.

Cermak, Jan: *See—*
Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, 4,528,006, Cl. 55-269.000.

Cerny, Robert S., to Allied Corporation. Ignition timing control system. 4,527,522, Cl. 123-416.000.

Chabat-Courrede, Jean, to Electricite de France (Service National). Apparatus for checking the set pressure of a safety valve. 4,527,415, Cl. 73-4.00R.

Challenger, Richard; and Mullane, William E., to Taylor-Winfield Corporation, The. Adhesive spot curing press and method for metallic parts. 4,528,057, Cl. 156-273.700.

Chamberlain, John T., to Burroughs Corp. Wafer scale integrated circuit memories. 4,528,647, Cl. 365-230.000.

Chan, Kai Y., to Fairchild Camera and Instrument Corporation. Method and apparatus for measuring the settling time of an analog signal. 4,527,907, Cl. 368-118.000.

Chandler, Philip B.: *See—*
Hunt, Stuart B. D.; Chandler, Philip B.; and Harrison, Thomas L., 4,528,056, Cl. 156-253.000.

Chang, Bong H.; and Ritchie, Joseph M., to Exxon Research and Engineering Co. Coking with solvent separation of recycle oil using coker naphtha and solvent recovery. 4,528,088, Cl. 208-96.000.

Chang, Wen-Hsuan; and Piccirilli, Robert, to PPG Industries, Inc. Curable, iminated resins from aminoplasts and hydroxyl-containing carboxylic acids. 4,528,333, Cl. 525-398.000.

Chang, Wen-Hsuan, to PPG Industries, Inc. Low molecular weight resins from nonaromatic polyols and aminoplasts. 4,528,344, Cl. 525-509.000.

Chant, Patrick: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,528,402, Cl. 568-445.000.

Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., to Northern Telecom Limited. Methods and apparatus for sealing articles. 4,528,150, Cl. 264-36.000.

Charlebois, Leonard J.; D'Aoust, Ronald R.; and Huszarik, Fred A., to Northern Telecom Limited. Forming of cable splice closures. 4,528,419, Cl. 174-88.00R.

Chastain, David M.: *See—*
Cline, James H.; and Chastain, David M., 4,528,666, Cl. 371-51.000.

Chatterjee, Shyam S.: *See—*
Jaggy, Hermann E. W.; Chatterjee, Shyam S.; and Gabard, Bernard L., 4,528,289, Cl. 514-285.000.

Chattha, Mohinder S.: *See—*
Theodore, Ares N.; and Chattha, Mohinder S., 4,528,317, Cl. 524-504.000.

Chaudot, Geard. System for increasing the recovery of product fluids from underwater marine deposits. 4,527,632, Cl. 166-357.000.

Chavand, Jean: *See—*
Billon-Pierron, Claude; Chavand, Jean; and Peccoud, Michel, 4,528,435, Cl. 219-69.00M.

Chebra, Ronald J.: *See—*
James, Rolland T.; and Chebra, Ronald J., 4,528,423, Cl. 179-5.00R.

Chemische Fabrik Stockhausen & Cie: *See—*
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,528,350, Cl. 526-307.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Gras, Rainer; and Riemer, Heinz, 4,528,355, Cl. 528-45.000.

Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., to AT&T Bell Laboratories. Degenerate four-wave mixer using multiple quantum well structures. 4,528,464, Cl. 307-425.000.

Chen, Shu P.: *See—*
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,528,235, Cl. 428-220.000.

Cheng, Chao-Jan; Donak, John R.; and Ahad, Samir E., to Northern Telecom Limited. Call progress signal monitor and method for telephone systems. 4,528,664, Cl. 370-110.300.

Chermey, Yvette L.: *See—*
Sines, Thomas E.; and Chermey, Yvette L., 4,527,648, Cl. 180-6.500.

Cherry Electrical Products Corporation: *See—*
Lewandowski, Raymond; and Leger, Raymond A., 4,528,430, Cl. 200-61.620.

Chevillard, Francis: *See—*
Tritton, Victor R.; Tritton, Gary E.; and Chevillard, Francis, 4,527,308, Cl. 24-30.50R.

Chevron Research Company: *See—*
Campbell, Curtis B., 4,527,996, Cl. 44-72.000.
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,528,649, Cl. 367-36.000.
Gunzel, Rudolph M., Jr.; Wichman, William J.; and Fujitaki, Roy K., 4,527,740, Cl. 239-318.000.

Chheda, Nemjee R., to Sundstrand Corporation. Volume control device. 4,527,580, Cl. 137-1.000.

Chianelli, Russell R.: *See—*
Pecoraro, Theresa A.; and Chianelli, Russell R., 4,528,089, Cl. 208-216.00R.

Chiba, Hiroshi: *See—*
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,527,845, Cl. 312-215.000.

Chicago Rawhide Manufacturing Company: *See—*
Szcupak, Peter, 4,527,673, Cl. 188-269.000.

Chicoye, Etzer: *See—*
Mizerak, Robert J.; Bertkau, Geoffrey H.; Line, William F.; and Chicoye, Etzer, 4,528,198, Cl. 426-16.000.

Childers, Carroll D., to United States of America, Navy. Small arms ammunition loading system. 4,527,459, Cl. 89-161.000.

Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt.: *See—*
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.

Chisso Corporation: *See—*
Shigehiro, Koga; Yoshihisa, Kanazawa; Takeshi, Okamoto; Masafumi, Yamanouchi; and Kazumichi, Sudo, 4,528,306, Cl. 523-219.000.

Chisum, Finis L. Method and apparatus for designing a log home. 4,527,981, Cl. 434-72.000.

Chloride Group Public Limited Company: *See—*
Hayes, Michael H.; and Pearson, Ernest J., 4,528,255, Cl. 429-233.000.

Choi, John I.: *See—*
Walther, James F.; and Choi, John I., 4,528,175, Cl. 423-492.000.

Chou, Fargo. Retractable comb and brush. 4,527,576, Cl. 132-123.000.

Chow, Hector; and Melling, Hugh, to Senmed, Inc. Disposable linear surgical stapling instrument. 4,527,724, Cl. 227-8.000.

Christen, Werner, to Draiswerke GmbH. Methods and mixers for the continuous addition of glue to mixtures consisting of wood chips, wood fibres or the like. 4,527,902, Cl. 366-169.000.

Chrysler Corporation: *See—*
Middleton, Jerry L.; and Bienick, Richard H., 4,527,601, Cl. 141-348.000.

Chu, Daniel T., to Abbott Laboratories. Methylenedioxy quino-benzothiazine derivatives. 4,528,285, Cl. 514-224.000.

Chubb, Donald L., to United States of America, National Aeronautics and Space Administration. Thermionic-photovoltaic energy converter. 4,528,417, Cl. 136-253.000.

Chung, Betsy A., executrix: *See—*
Chung, Rack H., deceased, 4,528,352, Cl. 528-18.000.

Chung, Rack H.; Lucas, Gary M.; and Liermann, August O., to General Electric Company. Process for producing RTV silicone rubber compositions using a devolatilizing extruder. 4,528,324, Cl. 524-863.000.

Chung, Rack H., deceased (by Chung, Betsy A., executrix), to General Electric Company. RTV silicon compositions and processes. 4,528,352, Cl. 528-18.000.

Ciba-Geigy Corporation: *See—*
Eckhardt, Wolfgang; and Kunz, Walter, 4,528,284, Cl. 514-84.000.
Henry, Rebecca D., 4,528,305, Cl. 523-219.000.
Lienhard, Paul; and Saar, Werner, 4,527,994, Cl. 8-494.000.
Nikles, Erwin, 4,528,374, Cl. 546-186.000.
Renner, Alfred, 4,528,357, Cl. 528-93.000.

Cise - Centro Informazioni Studi Esperienze S.p.A.: *See—*
Arisi, Sergio, 4,527,908, Cl. 374-147.000.

Citizen Watch Co., Ltd.: *See—*
Koizumi, Michio; Iwata, Yasuo; and Ohsawa, Seiichi, 4,527,921, Cl. 400-618.000.

Citta, Richard W., to Zenith Electronics Corporation. Peak load access in a two-way CATV contention system. 4,528,663, Cl. 370-94.000.

Civitelli, Gennaro. Door stop having multiple mounting positions. 4,527,303, Cl. 16-86.00B.

CJM Associates: *See—*
Jones, Edwin R., Jr., 4,528,587, Cl. 358-92.000.

Clark, Albert L., to Langkau, John F., a part interest. Wire twister. 4,527,599, Cl. 140-119.000.

Clark, Antony P., to Cast-Tec Ltd. Permanent mold casting systems. 4,527,611, Cl. 164-329.000.

Clark, Michael G.: *See—*
Glasper, John L.; Shanks, Ian A.; and Clark, Michael G., 4,527,863, Cl. 350-336.000.

Clark, William E., to Carrier Corporation. Thermostatic transducer. 4,527,735, Cl. 236-87.000.

Clark, William E.: *See—*
Swain, Roy E.; and Clark, William E., 4,527,734, Cl. 236-49.000.

Clarke, David C.: *See—*
Wolf, Peter H.; Clarke, David C.; and Hieber, Heinz H., 4,527,469, Cl. 101-93.040.

Clegg, John E. Prismatic wall heater. 4,527,546, Cl. 126-440.000.

Clemens, Alexander, to Robert Bosch GmbH. Multi-cylinder fuel injection pump for internal combustion engines. 4,527,962, Cl. 417-499.000.

Clevenger, David M., to Michelsen Packaging Company. Atmosphere control cushioning pad. 4,528,228, Cl. 428-74.000.

Clevepak Corporation: *See—*
Mauger, David W.; Lawrie, James W.; McCarthy, John T.; and Tozzi, Michael A., 4,527,376, Cl. 53-113.000.
Spathis, George; and Korrasik, Anita C., 4,528,217, Cl. 428-5.000.

Cliffe, Nicholas R., to Fade-In Products Limited. Windscreen accessory. 4,528,232, Cl. 428-195.000.

Cline, James H.; and Chastain, David M., to Texas Instruments Incorporated. Memory system with built in parity. 4,528,666, Cl. 371-51.000.

Cline, John: *See*—
Mugglestone, Peter; and Cline, John, 4,527,840, Cl. 308-6.00C.
Clouse, Clarence, to General Motors Corporation. Fuel filler door with dual hinge. 4,527,825, Cl. 296-1.00C.
Clouth Gummiwerke Aktiengesellschaft: *See*—
Ortwein, Hermann, 4,527,736, Cl. 238-283.000.
Cloutier, Frank L.; Low, Robert N.; McClelland, Paul H.; and Nielsen, Niels J., to Hewlett-Packard Co. Ink jet orifice plate having integral separators. 4,528,577, Cl. 346-140.00R.
Co-Exx Pipe Company, Inc.: *See*—
Murley, Jackie D., 4,527,970, Cl. 425-404.000.
Coal Industry (Patents) Limited: *See*—
McCaffrey, David J. A.; and Sheppard, John P., 4,528,107, Cl. 252-61.000.
Coates, Clarence A., Jr.: *See*—
Weaver, Max A.; and Coates, Clarence A., Jr., 4,528,368, Cl. 534-768.000.
Coates, David: *See*—
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,528,562, Cl. 340-805.000.
Coates, William J.; and Warrington, Brian H., to Smith Kline & French Laboratories Limited. Process for preparing 6-(2-hydroxyphenyl)-3-pyridazinone. 4,528,371, Cl. 544-239.000.
Cobbs, Walter H., Jr.; and Rehman, William R., to Nordson Corporation. Method and apparatus for dispensing liquid compositions. 4,527,712, Cl. 222-1.000.
Coben, Eugene S. Method for cephalometric quantitation and expression of growth. 4,528,627, Cl. 364-415.000.
Coffee, Robert L.: *See*—
Cantu, Lisa A.; Yost, Marvin E.; Coffee, Robert L.; and Stolhand, James E., 4,527,626, Cl. 166-275.000.
Cohen, Abraham B.: *See*—
Heiart, Robert B.; and Cohen, Abraham B., 4,527,890, Cl. 355-100.000.
Cohen, Andrew S. Tie rod with self-securing end. 4,527,768, Cl. 249-214.000.
Cohen, Arie: *See*—
DeVries, Douglas F.; and Cohen, Arie, 4,527,557, Cl. 128-204.230.
Cohen, Simon S.; and Ghezzo, Mario, to General Electric Company. Interconnection structure for polycrystalline silicon resistor and methods of making same. 4,528,582, Cl. 357-51.000.
Cole, Clinton W.: *See*—
Murali, Beegamudre N.; Rosenberg, Jeffrey S.; and Cole, Clinton W., 4,527,954, Cl. 417-46.000.
Cole-Parmer Instrument Company: *See*—
Dawson, John R., 4,527,323, Cl. 29-451.000.
Cole, Steven W., to United States of America, Energy. Method and apparatus for I-V data acquisition from solar cells. 4,528,503, Cl. 324-158.00D.
Coleman, Edwin T., III, to International Business Machines Corporation. Rocking switch actuator for a low force membrane contact switch. 4,528,431, Cl. 200-67.00A.
Coleman, Henry E., to Spring Water Brew International. Mineralized brewed beverages. 4,528,200, Cl. 426-74.000.
Coleman, William M., III; and Edmondson, Morris S., to Dow Chemical Company, The. Polymerization of olefins employing catalysts prepared from novel titanium compounds. 4,528,339, Cl. 526-127.000.
Colescott, Robert L.: *See*—
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,528,132, Cl. 260-112.50T.
Colgate-Palmolive Company: *See*—
Curtis, John P.; Crawford, Richard J.; and Yuhasz, Kathleen M., 4,528,182, Cl. 424-54.000.
Gaffar, Abdul, 4,528,179, Cl. 424-49.000.
Karami, Hamzeh, 4,527,989, Cl. 604-385.00A.
Morton, Anthony J.; Harvey, Kenneth; and Hayes, Harry, 4,528,181, Cl. 424-52.000.
Su, Dean T., 4,528,111, Cl. 252-107.000.
Collins, William F.: *See*—
Kump, Howard H.; and Collins, William F., 4,528,685, Cl. 378-157.000.
Collis, John S., Jr. X-ray table. 4,527,787, Cl. 269-322.000.
Colln, Reimer; and Mohrmann, Karl H., to Bayer Aktiengesellschaft. Preparation of substituted thiadiazolyloxyacetamides. 4,528,379, Cl. 546-209.000.
Collora, George A.; and Braun, Ronald C., to Grumman Aerospace Corporation. Universal contoured parts holding fixture. 4,527,783, Cl. 269-21.000.
Colmet, Serge: *See*—
Bak, Claude; Bellocci, Rio; and Colmet, Serge, 4,527,608, Cl. 164-58.100.
Colvin, Howard A.; Fiedler, Ronald D.; Muse, Joel, Jr.; and Smith, Donald E., to Goodyear Tire & Rubber Company, The. Process for the synthesis and purification of diisopropenylbenzene. 4,528,413, Cl. 585-440.000.
Combest, H. E. Buddy; and Tunks, Larry M., to Aladdin Equipment Company. Pressure indicator. 4,527,429, Cl. 73-744.000.
Combustion Engineering, Inc.: *See*—
Connelly, Ronald F., 4,527,503, Cl. 114-365.000.
Commissariat A L'Energie Atomique: *See*—
Billon-Pierron, Claude; Chavand, Jean; and Peccoud, Michel, 4,528,435, Cl. 219-69.00M.
Commonwealth Scientific and Industrial Research Organization: *See*—
Park, Robert J.; and Leppik, Raymond A., 4,528,272, Cl. 435-55.000.
Completion Tool Company: *See*—
Wood, Edward T.; and Sodich, Ernest O., 4,527,625, Cl. 166-187.000.
Computer Memories, Incorporated: *See*—
Quackenbush, James E., 4,528,514, Cl. 330-146.000.
Conax Corporation: *See*—
Dale, Steven M.; Paluch, Richard C.; and Setter, Gerald A., Jr., 4,527,909, Cl. 374-163.000.
Connelly, Ronald F., to Combustion Engineering, Inc. Spar buoy escape system for offshore platforms. 4,527,503, Cl. 114-365.000.
Conoco Inc.: *See*—
Cantu, Lisa A.; Yost, Marvin E.; Coffee, Robert L.; and Stolhand, James E., 4,527,626, Cl. 166-275.000.
Goodwin, Anton E.; Marton, Janet L.; Owens, Robert M.; Whisenhunt, Jackie W.; and Swain, Roy D., 4,528,162, Cl. 422-101.000.
Hastings, Ray D.; and Boyer, Ernest W., 4,528,553, Cl. 340-526.000.
Cook, Edward G., to Ultrasonic Power Corporation. Ultrasonic cleaning tank. 4,527,901, Cl. 366-127.000.
Coombs, David W.: *See*—
McGill, James C.; Alley, James R.; and Coombs, David W., 4,528,000, Cl. 55-2.00G.
Cooper, Emanuel; and Kohn, David H., to Technion Research & Development Foundation, Inc. Concurrent production of anhydrous non-metal and metalloid halides and ceramic materials with the aid of magnesium halide. 4,528,164, Cl. 423-1.000.
Cooper, Glenn D.; and Katchman, Arthur, to General Electric Company. Composition of polyphenylene ethers with core-shell rubber-modified polystyrene. 4,528,327, Cl. 525-68.000.
Cooper Industries, Inc.: *See*—
Jones, Herman S.; and Blackman, William C., 4,527,334, Cl. 33-138.000.
Cooper, James L.: *See*—
Perkins, William R.; and Cooper, James L., 4,527,456, Cl. 84-1.040.
Copal Company Limited: *See*—
Kurosu, Tomio; and Yoshikawa, Yukio, 4,527,877, Cl. 354-234.100.
Cope, Appleton D., to RCA Corporation. Suppression of edge effects arising in CCD imager field registers. 4,528,596, Cl. 358-213.000.
Corbin, Krestine, executrix: *See*—
Dickinson, Lawrence C., deceased; and Corbin, Krestine, executrix, 4,527,929, Cl. 407-1.000.
Corbin, Raymond L. R., to Manville Service Corp. Three-tab shingle with staggered butt edge feature. 4,527,374, Cl. 52-557.000.
Corey, John A. Heater head for stirling engine. 4,527,394, Cl. 60-517.000.
Corning Glass Works: *See*—
Sarkar, Arnab, 4,528,009, Cl. 65-3.120.
Cortex Research Corporation: *See*—
Fosslien, Egil, 4,527,438, Cl. 73-864.810.
Coulter Electronics, Inc.: *See*—
Carter, James H.; Ledis, Stephen L.; Crews, Harold R.; Sena, Ted; and Larsen, Fred L., 4,528,274, Cl. 436-10.000.
Council for Mineral Technology: *See*—
Preston, John S., 4,528,167, Cl. 423-139.000.
Courbot, Pierre, to Societe Anonyme D.B.A. Disc brake. 4,527,667, Cl. 188-73.340.
Courbot, Pierre, to Societe Anonyme D.B.A. Disc brake. 4,527,570, Cl. 188-73.440.
Courdille, Michel: *See*—
Steers, Michel; Hazan, Jean-Pierre; and Courdille, Michel, 4,528,558, Cl. 340-686.000.
Coyner, John V.: *See*—
Tobey, William H.; Coyner, John V.; and Gardner, William J., 4,527,362, Cl. 52-71.000.
Crawford, Richard J.: *See*—
Curtis, John P.; Crawford, Richard J.; and Yuhasz, Kathleen M., 4,528,182, Cl. 424-54.000.
Crawford, Robert J., to Procter & Gamble Company, The. Synthesis of alpha-dithiophosphato amides. 4,528,140, Cl. 260-402.500.
Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Substituted 3,4-diamino-1,2,5-thiadiazoles having histamine H_2-receptor antagonist activity. 4,528,375, Cl. 546-193.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Substituted 3,4-diamino-1,2,5-thiadiazoles having histamine H_2-receptor antagonist activity. 4,528,377, Cl. 546-209.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Substituted 3,4-diamino-1,2,5-thiadiazoles having histamine H_2-receptor antagonist activity. 4,528,378, Cl. 546-209.000.
Creusot-Loire: *See*—
Ducournau, Alain; and Barras, Francois, 4,527,476, Cl. 101-352.000.
Pinto, Georges, 4,527,487, Cl. 105-223.000.
Crews, Harold R.: *See*—
Carter, James H.; Ledis, Stephen L.; Crews, Harold R.; Sena, Ted; and Larsen, Fred L., 4,528,274, Cl. 436-10.000.
Crick, Neil; and Miles, Anthony, to Racal Recorders Limited. Electrical calibration arrangements. 4,528,602, Cl. 360-66.000.
Criswell, Peter B., to Sperry Corporation. Method and a means for checking normalizing operations in a computer device. 4,528,640, Cl. 364-737.000.
Critelli, Thomas P. Method of filling an athletic bag with air and liquid. 4,527,796, Cl. 272-77.000.
Crossland, William A.; Coates, David; and Ayliffe, Peter J., to International Standard Electric Corporation. Co-ordinate addressing of smectic display cells. 4,528,562, Cl. 340-805.000.
Crowley, Albert T., to RCA Corporation. Fast tuned phase locked loop frequency control system. 4,528,523, Cl. 331-10.000.

Cruise, Thomas E. Insulated concrete masonry unit with low density heat bridges. 4,527,373, Cl. 52-405.000.

Crumbacher, Thomas A.: *See—*
Singh, Anand P.; Blosser, Virgil Y.; and Crumbacher, Thomas A., 4,527,946, Cl. 425-42.000.

Cryberg, Richard L.; and Bimber, Russell M., to SDS Biotech Corporation. Preparation of ketones. 4,528,400, Cl. 568-314.000.

Cselt-Centro Studi E Laboratori Telecommunicazioni S.p.A.: *See—*
Melindo, Flavio; and Sartori, Mario, 4,528,425, Cl. 179-18.0HB.

CTB, Inc.: *See—*
Hart, Felix; and Eby, Devon, 4,527,513, Cl. 119-51.500.

Cue, Berkeley W., Jr.; and Moore, Bernard S., to Pfizer Inc. Sorbinil by optical resolution of precursor 6-fluoro-4-ureidochroman-4-carboxylic acid. 4,528,387, Cl. 549-404.000.

Culler, Lawrence R.: *See—*
Roth, David J.; Culler, Lawrence R.; and Heifner, Ralph D., 4,527,779, Cl. 266-227.000.

Cummings, Robert, to U.S. Clinical Products, Inc. Flexible sterile closure system for containers. 4,527,703, Cl. 215-232.000.

Cunningham, Sinclair: *See—*
Eisenbacher, Egon; Cunningham, Sinclair; Wusthof, Peter; and Cunningham, Sinclair, 4,527,460, Cl. 91-491.000.
Eisenbacher, Egon; Cunningham, Sinclair; Wusthof, Peter; and Cunningham, Sinclair, 4,527,460, Cl. 91-491.000.

Cupani, Carmine, to Inteleplex Corporation, The. Transparent secondary information transmission system for an information transmission system. 4,528,422, Cl. 179-2.00A.

Curtis, John P.; Crawford, Richard J.; and Yuhasz, Kathleen M., to Colgate-Palmolive Company. Stable antiplaque dentifrice with improved foaming. 4,528,182, Cl. 424-54.000.

Cuscurida, Michael: *See—*
Speranza, George P.; and Cuscurida, Michael, 4,528,112, Cl. 252-182.000.

CVD Equipment Corp.: *See—*
Rosenbaum, Leonard A., 4,527,715, Cl. 222-61.000.

Cyanamid Canada, Inc.: *See—*
Hacetoglu, Ararat; and Kodatsky, William K., 4,528,031, Cl. 75-53.000.

Cyclops Corporation: *See—*
Ryan, Thomas G., 4,527,372, Cl. 52-334.000.

Czechoslovenska akademia ved: *See—*
Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, 4,528,006, Cl. 55-269.000.

D. C. Brennan Firearms, Inc.: *See—*
Brennan, Dean C., 4,527,348, Cl. 42-76.00R.

Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, to Wojskowa Akademia Techniczna Im. Liquid crystalline cyclohexylbenzene derivatives their preparation and the liquid compositions containing same. 4,528,116, Cl. 252-299.630.

Dahlgren, Harold P.; Taylor, James E.; and Peters, Dwight W. Dampening fluid removal device. 4,527,471, Cl. 101-148.000.

Dahlgren, Harold P.; Taylor, James E.; and Peters, Dwight W. Ink removal, circulating and distributing system. 4,527,479, Cl. 101-450.100.

Dahmen, Kurt: *See—*
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,528,350, Cl. 526-307.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Fujita, Takeshi; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,528,360, Cl. 528-297.000.

Daikin Kogyo Co., Ltd.: *See—*
Takahara, Takao; and Shimokawa, Kazuhiro, 4,528,137, Cl. 260-397.400.

Daimler-Benz Aktiengesellschaft: *See—*
Mauermann, Walter; and Dudeck, Ingo, 4,527,525, Cl. 123-425.000.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Uno, Hitoshi; Karasawa, Tadahiko; Kon, Tatsuya; and Ito, Tsugutaka, 4,528,299, Cl. 514-428.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,527,878, Cl. 354-298.000.

Dainippun Ink and Chemicals, Inc.: *See—*
Sugie, Toshinori; Ishikawa, Ryoichi; and Kobata, Fumihiro, 4,528,346, Cl. 525-523.000.

Daito, Michimasa: *See—*
Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, 4,528,074, Cl. 204-16.000.

Dale, Steven M.; Paluch, Richard C.; and Setter, Gerald A., Jr., to Conax Corporation. Sealed temperature probe. 4,527,909, Cl. 374-163.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Polymerization products of vinylacetylene-terminated polyimide derivatives. 4,528,349, Cl. 526-262.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Vinylacetylene-terminated polyimide derivatives. 4,528,373, Cl. 546-66.000.

Dallas Corporation: *See—*
Urbanick, Burton A., 4,527,807, Cl. 277-189.000.

Dam, Poul S.: *See—*
Jorgensen, Peter; Molbaek, Jens J.; Spies, Volker; Dyhr-Mikkelsen, Poul C.; and Dam, Poul S., 4,527,595, Cl. 138-43.000.

Damiano, Victor V.: *See—*
Baldi, Alfonso L.; and Damiano, Victor V., 4,528,215, Cl. 427-252.000.

Dana Corporation: *See—*
Zackrisson, Barry L., 4,527,978, Cl. 464-183.000.

Danfoss A/S: *See—*
Jorgensen, Peter; Molbaek, Jens J.; Spies, Volker; Dyhr-Mikkelsen, Poul C.; and Dam, Poul S., 4,527,595, Cl. 138-43.000.

Dang, Thuy N.: *See—*
Bruns, Klaus; and Dang, Thuy N., 4,528,126, Cl. 252-522.00R.

Danneberg, Jorg. Process for the finishing and/or drying of wash. 4,527,343, Cl. 34-16.000.

D'Aoust, Ronald R.: *See—*
Charlebois, Leonard J.; D'Aoust, Ronald R.; and Huszarik, Fred A., 4,528,419, Cl. 174-88.00R.

Dart Industries Inc.: *See—*
Dobson, William C.; and Spoeth, Carl R., 4,528,429, Cl. 200-50.00B.

Das, Santanu: *See—*
Middleton, Francisco A.; Das, Santanu; and Hargrave, Franklin, 4,528,424, Cl. 179-17.00A.

Data Bind Inc.: *See—*
Waldman, Morton, 4,527,923, Cl. 402-75.000.

Dataproducts Corporation: *See—*
Smithbauer, Donald J.; Lytle, Daniel R.; and Helms, Clifford, 4,527,470, Cl. 101-111.000.
Wolf, Peter H.; Clarke, David C.; and Hieber, Heinz H., 4,527,469, Cl. 101-93.040.

Daumer, Rolf; Feldmann, Ekkehard; Person, Martin; Wild, Ernst; and Zechnall, Martin, to Robert Bosch GmbH. System for damping bucking oscillations of an automobile engine. 4,527,523, Cl. 123-419.000.

David, Eugene C.: *See—*
Stump, Lee E.; David, Eugene C.; and Boehne, Dale, 4,527,359, Cl. 51-138.000.

Davidson, Donald J., to Rockwell International Corporation. Disc brake friction pad support and biasing assembly. 4,527,668, Cl. 188-73.380.

Davis, Joseph, to United Technologies Corporation. Lubrication system. 4,527,911, Cl. 384-99.000.

Davis, Newton G., to AMP Incorporated. Stripping tool for shielded ribbon cable. 4,527,451, Cl. 81-9.510.

Davis, Thomas J.; and Tomeraasen, Paul L., to United States of America, Air Force. Ferromagnetic resonance probe liftoff suppression apparatus. 4,528,506, Cl. 324-225.000.

Davison, Charles F., to Norwood Marking & Equipment Co., Inc. Exchangeable print head hot ink roll marker. 4,527,472, Cl. 101-219.000.

Davison, Charles F., to Norwood Marking & Equipment Co., Inc. Imprinter printhead and shuttle assembly. 4,527,475, Cl. 101-316.000.

Davy McKee: *See—*
Hofmann, Hansdieter; Rothe, Hans-Jochen; Skupin, Georg; and Wolff, Konrad, 4,528,362, Cl. 528-336.000.

Dawson, John R., to Cole-Parmer Instrument Company. Tubing loading key. 4,527,323, Cl. 29-451.000.

Day, John T.: *See—*
Udy, Lex L.; and Day, John T., 4,528,049, Cl. 149-21.000.

Day, Lawrence, to General Signal Corporation. Removable polishing pad assembly. 4,527,358, Cl. 51-131.300.

Dayco Corporation: *See—*
Long, Delmar D.; and Hill, James D., Jr., 4,528,214, Cl. 427-173.000.

Dean, Barry D., to Atlantic Richfield Company. Polyamide-impact modified styrenic polyblends. 4,528,326, Cl. 525-66.000.

Dean, Mark E.; and Moeller, Dennis L., to International Business Machines Corporation. Microcomputer system with bus control means for peripheral processing devices. 4,528,626, Cl. 364-200.000.

Dean, Weibley J.; Johnson, Charles E.; and Ragard, Phillip A., to Universal Instruments Corporation. Leadless chip placement machine for printed circuit boards. 4,527,324, Cl. 29-564.600.

Dechelette, Helen, to Molex Incorporated. Multigauge insulation displacement connector and contacts therefor. 4,527,852, Cl. 339-97.00P.

Dechelette, Helen, to Molex Incorporated. Miniature electrical connector assembly. 4,527,853, Cl. 339-97.00R.

Deckard, John I., to General Motors Corporation. Electromagnetic unit fuel injector with differential valve. 4,527,737, Cl. 239-89.000.

Deconinck, Hugo F., to Agfa-Gevaert N.V. Apparatus for loading plane film cassettes in daylight. 4,527,320, Cl. 29-33.00R.

Dehmel, Georg: *See—*
Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, 4,527,746, Cl. 241-23.000.

Dekker, Lambert: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,528,402, Cl. 568-445.000.

Delalande S.A.: *See—*
Lacour, Alain P.; Langlois, Michel; Jalfre, Maurice F.; and Bucher, Bernard P., 4,528,380, Cl. 548-250.000.

Dellapina, Marco: *See—*
Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, 4,528,099, Cl. 210-489.000.

Dellar, David V.: *See—*
Woo, Edmund P.; and Dellar, David V., 4,528,366, Cl. 528-422.000.

DELTA-REAL Establishment: *See—*
Morax, Francois, 4,527,455, Cl. 83-588.000.

DeMarco, Joseph P.: *See—*
Ruehl, William E.; and DeMarco, Joseph P., 4,527,312, Cl. 24-453.000.

DeMoss, Larry A., to Edwards, Stephen A., a part interest. Seat attachment and steering arrangement for recumbent bicycle or the like. 4,527,811, Cl. 280-281.0LP.

Dempsey, Russell M.. *See—*
LaConti, Anthony B.; Enos, John F.; Dempsey, Russell M.; and Fragala, Anthony R., 4,528,083, Cl. 204-265.000.

Denholm, A. Stuart: *See—*
Hirvonen, James K.; Wittkower, Andrew B.; and Denholm, A. Stuart, 4,528,208, Cl. 427-35.000.

Denton, Donald W., to State Industries, Inc. Water heater construction. 4,527,543, Cl. 126-361.000.

de Oliveira, David G.: *See—*
Bruff, William; de Santana, Geraldo S.; and de Oliveira, David G., 4,527,329, Cl. 29-825.000.

de Santana, Geraldo S.: *See—*
Bruff, William; de Santana, Geraldo S.; and de Oliveira, David G., 4,527,329, Cl. 29-825.000.

Desilets, Norman H.; Gazda, Chester T.; and Zamachaj, Richard A., to Titeflex Corporation. Frost-free metal hose construction. 4,527,819, Cl. 285-287.000.

DeSisto, Richard E., to General Signal Corporation. Bearing air seal for vacuum cleaner motor. 4,527,960, Cl. 417-368.000.

Despe, Oscar D.: *See—*
Keefe, Donald J.; and Despe, Oscar D., 4,528,457, Cl. 307-46.000.

Despot, Janko: *See—*
Galster, Hans-Peter; and Despot, Janko, 4,527,477, Cl. 101-365.000.

DeTrano, Mario: *See—*
Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., 4,528,331, Cl. 525-313.000.

Dettinger, Willi; and Fries, Hugo, to URACA Pumpenfabrik GmbH & Co. KG. Piston pump. 4,527,957, Cl. 417-92.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Blaseck, Klaus, 4,527,934, Cl. 414-4.000.
Heimerl, Wilfried C., 4,528,014, Cl. 65-142.000.

DeVries, Douglas F.; and Cohen, Arie, to Bear Medical Systems, Inc. Medical ventilator system. 4,527,557, Cl. 128-204.230.

Dicke, William C., to Singer Company, The. Actuator for in-line sander. 4,527,360, Cl. 51-170.0TL.

Dickinson, Ben W. O., III; Dickinson, Robert W.; and Hutchison, Stanley O., to Bechtel National Corp. Hydraulic piston-effect method and apparatus for forming a bore hole. 4,527,639, Cl. 175-61.000.

Dickinson, John; and Warhurst, Peter. Device for installing an article on a vertical surface. 4,527,338, Cl. 33-180.00R.

Dickinson, Lawrence C., deceased; and Corbin, Krestine, executrix. Roller-guided cutting tool. 4,527,929, Cl. 407-1.000.

Dickinson, Robert W.: *See—*
Dickinson, Ben W. O., III; Dickinson, Robert W.; and Hutchison, Stanley O., 4,527,639, Cl. 175-61.000.

Dienes, Larry E.: *See—*
Bisacquino, Lenora A.; Dienes, Larry E.; and Plasko, Rudolph J., 4,528,590, Cl. 338-153.000.

Diers, Franz: *See—*
Miller, Gert; Diers, Franz; and Hermanns, Hans-Josef, 4,527,577, Cl. 133-3.00H.

Dieterich, Charles B., to RCA Corporation. Digital FM ratio detector with gain-controlled filter. 4,528,513, Cl. 329-145.000.

Dietrich, Bernhard, to SDS-Elektro GmbH. Electrical plug connection for an electrical cable containing a traction relief. 4,527,855, Cl. 339-104.000.

Difflipp, Kurt; and Ochs, Henrich, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Means for clamping gravure plates. 4,527,478, Cl. 101-415.100.

Dill, Walter R.; and Gdanski, Ricky D., to Halliburton Company. Method of temporarily plugging portions of a subterranean formation using a diverting agent. 4,527,628, Cl. 166-295.000.

Dilley, James E.: *See—*
Graves, Alan F.; and Dilley, James E., 4,528,550, Cl. 340-347.0DD.

Dimeff, John; and Stewart, Clyde R., to Mark Telephone Products, Inc. Sensor for underground duct probe. 4,527,419, Cl. 73-40.50A.

Dir, Gary A., to Xerox Corporation. High contrast liquid crystal display devices. 4,527,864, Cl. 350-337.000.

Discenza, Giovanni J.: *See—*
Kish, Paul P.; and Discenza, Giovanni J., 4,528,420, Cl. 174-112.000.

Dittrich, Hans; and Frey, Hartmut, to Kernforschungszentrum Karlsruhe GmbH. Apparatus for separating gaseous hydrogen isotopes. 4,528,003, Cl. 55-158.000.

Djukic, Spasa. Smoking pipe assembly. 4,527,571, Cl. 131-329.000.

Doane, John C.; and Skalski, Clement A., to Otis Elevator Company. Elevator speed control. 4,527,662, Cl. 187-29.00R.

Dobson, Deborah H.: *See—*
Rickey, Wynn P.; Dobson, Deborah H.; and Huffaker, Roger W., 4,528,041, Cl. 134-8.000.

Dobson, William C.; and Spoeth, Carl R., to Dart Industries Inc. Electrical switch-plug assembly with baffle. 4,528,429, Cl. 200-50.00B.

Dr. Willmar Schwabe GmbH & Co.: *See—*
Jaggy, Hermann E. W.; Chatterjee, Shyam S.; and Gabard, Bernard L., 4,528,289, Cl. 514-285.000.

Doddi, Namassivaya: *See—*
Beard, Charles D.; Yamada, Akira; and Doddi, Namassivaya, 4,528,311, Cl. 524-91.000.

Dodey, Pierre: *See—*
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,528,294, Cl. 514-327.000.

Doggett, David E., to Benson, Inc. Plane linear grating for optically encoding information. 4,528,448, Cl. 250-231.0SE.

Doi, Hiroaki: *See—*
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.

Dolan, Richard J.; Cangiano, Frank; and Van der Linde, John, to GTE Products Corporation. Replaceable lamp unit providing hermetic seal and fixed alignment for electric lamp contained therein and automobile headlight utilizing same. 4,528,619, Cl. 362-61.000.

Domin, Thomas M.; Landis, Dan R.; and Williams, Paul, to AccuRay Corporation. Sheet measuring apparatus with two structurally isolated non-contacting surface follower bodies and wireless signal transmission. 4,528,507, Cl. 324-229.000.

Donak, John R.: *See—*
Cheng, Chao-Jan; Donak, John R.; and Ahad, Samir E., 4,528,664, Cl. 370-110.300.

Donohue, Terence; and Geosling, Christine E., to United States of America, Navy. Photochemical method for the separation of mixtures of xenon and krypton. 4,528,080, Cl. 204-157.10R.

Dorner, Karlheinz; and Mohrholz, Kurt, to Ford Motor Company. Unitary clip for retaining control lines on a flange. 4,527,759, Cl. 248-73.000.

Dorpmund, Willi; and Kreienbrink, Volker, to Graaff, Kommanditgesellschaft. Device for locking pivotally mounted corner posts of loading platforms. 4,527,765, Cl. 248-346.000.

Dorr-Oliver Incorporated: *See—*
Spilkin, Gordon; Eichler, Jack H.; and Kos, Peter, 4,528,103, Cl. 210-791.000.

Dorrough Electronics: *See—*
Dorrough, Michael L.; and Gold, Kenneth S., 4,528,501, Cl. 324-103.00P.

Dorrough, Michael L.; and Gold, Kenneth S., to Dorrough Electronics. Dual loudness meter and method. 4,528,501, Cl. 324-103.00P.

Dorsman, Adrian K., to Rockwell International Corporation. Floating precision current source. 4,528,495, Cl. 323-268.000.

Dotti, Enrico, to Societa' Cavi Pirelli S.p.A. Method and apparatus for forming grooves in an optical fiber support. 4,528,148, Cl. 264-1.500.

Dotti, Giulio; and Roggero, Bruno, to Fiat Auto S.p.A. Flow control valve for hydraulic circuits. 4,527,592, Cl. 137-625.610.

Dow Chemical Company, The: *See—*
Alderman, Daniel A.; and Zweigle, Maurice L., 4,528,125, Cl. 252-522.00A.
Berman, Jody R.; Bertram, James L.; and Whiteside, Ross C., Jr., 4,528,359, Cl. 528-109.000.
Coleman, William M., III; and Edmondson, Morris S., 4,528,339, Cl. 526-127.000.
Fisher, Julie M.; Tumminia, Dennis R.; and Behr, R. Douglas, 4,527,314, Cl. 24-587.000.
Holderegger, Rolf; and Jilek, Josef H., 4,528,127, Cl. 525-530.000.
Leathers, Joel M., 4,527,430, Cl. 73-745.000.
Miller, Theodore E., Jr., 4,527,421, Cl. 73-64.400.
Otterbacher, Eric W., 4,528,394, Cl. 560-061.000.
Park, Chung P., 4,528,300, Cl. 521-79.000.
Prier, Donald G., 4,528,364, Cl. 528-370.000.
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., 4,528,384, Cl. 549-78.000.
Treybig, Duane S.; and Potter, James L., 4,528,391, Cl. 560-026.000.
Watson, John D., Sr.; and Rhodes, Billie B., 4,528,168, Cl. 423-184.000.
Woo, Edmund P.; and Dellar, David V., 4,528,366, Cl. 528-422.000.

Dow Corning Corporation: *See—*
Kookootsedes, Gust J.; and Reese, Herschel H., 4,528,243, Cl. 428-425.500.
Swihart, Terence J.; and Jones, James E., 4,528,313, Cl. 524-397.000.

Dragerwerk Aktiengesellschaft: *See—*
Albarda, Scato, 4,527,463, Cl. 92-84.000.
Eckstein, Wolfgang; Leichnitz, Kurt; Pannwitz, Karl-Heinz; Rabenecker, Horst; and Wolff, Gunter, 4,528,160, Cl. 422-86.000.

Draiswerke GmbH: *See—*
Christen, Werner, 4,527,902, Cl. 366-169.000.

Drake, Kenneth: *See—*
Knopf, Robert J.; and Drake, Kenneth, 4,528,334, Cl. 525-404.000.

Dreiling, Cletus F. Framing stud template. 4,527,337, Cl. 33-562.000.

Dresser Industries, Inc.: *See—*
Simpson, Donald C., 4,527,583, Cl. 137-82.000.
Winkelbauer, Howard M.; and Wang, Ke-Chin, 4,528,244, Cl. 428-446.000.

Dressler, Roger W., to Motorola, Inc. Fader circuit for vehicle sound system. 4,528,686, Cl. 381-28.000.

Drivetec, Inc.: *See—*
Thompson, Herbert E., 4,528,607, Cl. 360-106.000.

Drosky, Billy J. Stopper extractor. 4,527,450, Cl. 81-3.290.

DSM Resins B.V.: *See—*
Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, 4,528,341, Cl. 525-438.000.

DuBroff, William; Kaegi, Dennis D.; Knoerzer, Jerome J.; and Spearin, Elliott Y., to Inland Steel Company. Solvent pretreatment of coal to improve coke strength. 4,528,069, Cl. 201-20.000.

Ducournau, Alain; and Barras, Francois, to Creusot-Loire. Inking mechanism for a printing press. 4,527,476, Cl. 101-352.000.

Dudeck, Ingo: *See*—
Mauermann, Walter; and Dudeck, Ingo, 4,527,525, Cl. 123-425.000.
Duell, Richard J., to Carrier Corporation. Rear panel and bracket mounting for a fan coil unit. 4,527,762, Cl. 248-222.100.
Dummer, Gerhard: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, 4,528,174, Cl. 423-488.000.
Dunaway, Thomas J.; Spielberger, Richard K.; and Wittenberger, John C., to Honeywell Inc. Optoelectronic lens array with an integrated circuit. 4,528,446, Cl. 250-216.000.
Duncombe, Edward; and Thatcher, Gordon, to United Kingdom Atomic Energy Authority. Electromagnetic pumps of the helical linear induction type. 4,527,955, Cl. 417-50.000.
Dundas, Richard E.; and Visser, Gerald H., to Plymouth Tank of West Michigan, Inc. Liquid tank spillage control system. 4,527,708, Cl. 220-18.000.
Dunham-Bush, Inc.: *See*—
Ingalls, Robert A., 4,527,967, Cl. 418-150.000.
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., to Owens-Corning Fiberglas Corporation. Melting furnaces. 4,528,013, Cl. 65-136.000.
Dunn, Joseph P. Wind resistance exercise device. 4,527,794, Cl. 272-70.000.
Du Pont de Nemours, E. I., and Company: *See*—
Baker, W. Barry; and Betsill, Harry E., 4,527,953, Cl. 417-38.000.
Farnham, William B., 4,528,389, Cl. 556-446.000.
Flynn, Robert J., 4,527,754, Cl. 242-118.100.
Hauser, William P., 4,528,261, Cl. 430-322.000.
Heiart, Robert B.; and Cohen, Abraham B., 4,527,890, Cl. 355-100.000.
Lepone, Gerald E., 4,528,024, Cl. 71-92.000.
Meehan, Patrick J., 4,528,657, Cl. 378-47.000.
Duwel, Edward C.: *See*—
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Dyhr-Mikkelsen, Poul C.: *See*—
Jorgensen, Peter; Molbaek, Jens J.; Spies, Volker; Dyhr-Mikkelsen, Poul C.; and Dam, Poul S., 4,527,595, Cl. 138-43.000.
Dynagel, Incorporated: *See*—
Shank, Joseph L., 4,528,204, Cl. 426-576.000.
Dynamit Nobel AG: *See*—
aus der Funten, Helmut; and Vogt, Wilhelm, 4,528,385, Cl. 549-307.000.
Dziaduszek, Jerzy: *See*—
Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, 4,528,116, Cl. 252-299.630.
Dziark, John J.: *See*—
Lucas, Gary M.; and Dziark, John J., 4,528,353, Cl. 528-21.000.
E. F. Houghton & Co.: *See*—
Warchol, Joseph F., 4,528,044, Cl. 148-18.000.
E. R. Squibb & Sons, Inc.: *See*—
Varma, Ravi K.; and Karanewsky, Donald S., 4,528,138, Cl. 260-397.450.
E-Systems, Inc.: *See*—
Sweeney, Dennis A.; and Sanders, David E., 4,528,674, Cl. 375-1.000.
Eastman Kodak Company: *See*—
Alligood, John H., 4,527,873, Cl. 354-121.000.
Edwards, Ray, 4,528,312, Cl. 524-232.000.
Lambeth, David N., 4,527,891, Cl. 356-1.000.
Weaver, Max A.; and Coates, Clarence A., Jr., 4,528,368, Cl. 534-768.000.
Eaton Corporation: *See*—
Forsell, Kenneth A.; and Mallonen, Edward A., 4,528,539, Cl. 337-49.000.
Kolze, Lawrence A., 4,527,590, Cl. 137-596.170.
Mathews, George P., 4,527,683, Cl. 192-111.00A.
Richards, Elmer A., 4,527,447, Cl. 74-866.000.
Ebihara, Hideyuki: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,527,845, Cl. 312-215.000.
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Hart, Felix; and Eby, Devon, 4,527,513, Cl. 119-51.500.
Eck, Herbert; Hannebaum, Manfred; and Kemenater, Christof, to Wacker-Chemie GmbH. Process for the preparation of polymer dispersions and their application. 4,528,315, Cl. 524-458.000.
Eckert, John F., to American Hospital Supply Corp. Probe for automated liquid dispenser. 4,528,161, Cl. 422-100.000.
Eckhardt, Wolfgang; and Kunz, Walter, to Ciba-Geigy Corporation. Fungicidal 2-(azolylmethyl-1'-yl)-2-aryl-2-(cyano, alkoxycarbonyl, alkylthiocarbonyl and aminocarbonyl)-2-phosphorus acid esters. 4,528,284, Cl. 514-84.000.
Eckstein, Eugene C.; Block, Norman L.; Kline, Jacob; and Pinchuk, Leonard, to University of Miami. Hydrogel surface of urological prosthesis. 4,527,293, Cl. 623-12.000.
Eckstein, Wolfgang; Leichnitz, Kurt; Pannwitz, Karl-Heinz; Rabenecker, Horst; and Wolff, Gunter, to Dragerwerk Aktiengesellschaft. Gas dosimeter construction. 4,528,160, Cl. 422-86.000.
Edahiro, Takao; Inagaki, Nobuo; and Kurosaki, Shiro, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries. Process for producing optical glass product. 4,528,010, Cl. 65-18.100.
Ede, Douglas F. C.; Wilkinson, Brian S.; and Mynott, Colin B., to Newjig Limited. Workbenches. 4,527,605, Cl. 144-286.00R.
Eden, Dayton D.; and Case, William E., to LTV Aerospace and Defense. Scanning laser for a scanning laser radar. 4,528,525, Cl. 332-7.510.
Edmondson, Morris S.: *See*—
Coleman, William M., III; and Edmondson, Morris S., 4,528,339, Cl. 526-127.000.
Edwards, Edward W. Alternating variable delay control arrangement and method for push-pull audio transducers. 4,528,691, Cl. 381-97.000.
Edwards, Ray, to Eastman Kodak Company. Degraded polyolefin containing extrusion coating compositions having good adhesion to a substrate at fast coating speeds. 4,528,312, Cl. 524-232.000.
Edwards, Stephen A.: *See*—
DeMoss, Larry A., 4,527,811, Cl. 280-281.0LP.
Edwards, Thomas R., to United States of America, National Aeronautics and Space Administration. Method of and apparatus for generating an inerstitial point in a data stream having an even number of data points. 4,528,639, Cl. 364-723.000.
Egami, Kazunari: *See*—
Umeda, Tetsuo; Egami, Kazunari; Tsukakoshi, Naoto; and Nishijima, Yasuo, 4,528,692, Cl. 382-9.000.
Eggeman, Vincent A.; Bubb, Jerome D.; Siegel, Harvey R.; and Wichman, Francis H., to Fort Wayne Truck Parts & Equipment, Inc. Ram supported sensing shield for power presses. 4,527,684, Cl. 192-130.000.
Eguchi, Yasukata; Nomoto, Reishi; and Takahashi, Masayoshi, to Janome Sewing Machine Co. Ltd. Suturing needle for medical operation. 4,527,564, Cl. 128-339.000.
Ehrenstein, Gottfried: *See*—
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Eichler, Jack H.: *See*—
Spilkin, Gordon; Eichler, Jack H.; and Kos, Peter, 4,528,103, Cl. 210-791.000.
Eichweber, Kurt, to Precitronic Gesellschaft fur Feinmechanik und Electronic m.b.H. Sabot projectile guide. 4,527,483, Cl. 102-521.000.
Eisenbacher, Egon; Cunningham, Sinclair; Wusthof, Peter; and Cunningham, Sinclair, to Mannesmann Rexroth GmbH. Radial piston machine. 4,527,460, Cl. 91-491.000.
Elder, Danny S., to Alcan Aluminum Corporation. Production of cross-linked polymeric extruded articles. 4,528,155, Cl. 264-174.000.
Electric Power Research Institute: *See*—
Bedell, John R.; and Rosenthal, Eli, 4,527,613, Cl. 164-463.000.
Electric Power Research Institute, Inc.: *See*—
Baird, Richard H.; Blechar, Theodore J.; Giladett, Leo V. B.; Horner, Reginald M.; Prouty, Gerald G.; and Rinde, David L., 4,527,623, Cl. 165-173.000.
Electricite de France (Service National): *See*—
Chabat-Courrede, Jean, 4,527,415, Cl. 73-4.00R.
Electron Beam Corporation: *See*—
Livesay, William R., 4,528,452, Cl. 250-491.100.
Elektroschmelzwerk Kempten GmbH: *See*—
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,528,120, Cl. 252-516.000.
Eli Lilly and Company: *See*—
Molloy, Bryan B.; and Steinberg, Mitchell I., 4,528,177, Cl. 424-1.100.
Wild, Gene M., 4,528,369, Cl. 536-7.100.
Wong, David T.; and Foreman, Mark M., 4,528,290, Cl. 514-293.000.
Elkem a/s: *See*—
Bruff, William; de Santana, Geraldo S.; and de Oliveira, David G., 4,527,329, Cl. 29-825.000.
Elliott, Eric R. Seal-free impeller pump for fluids containing abrasive materials or the like. 4,527,947, Cl. 415-121.00B.
Ellis, Billie J. Cold facial applicator. 4,527,565, Cl. 128-402.000.
Eltech Systems Corporation: *See*—
Barnes, Albert L., 4,528,119, Cl. 252-503.000.
Beer, Henri B.; and Hinden, Jean M., 4,528,084, Cl. 204-290.00F.
Ely, Lane O.: *See*—
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Emhart Industries, Inc.: *See*—
Abbott, Vaughan; Morris, Nicholas G.; Lambert, Scott M.; and Letellier, Richard A., 4,528,015, Cl. 65-162.000.
Abbott, Vaughan; Beckwith, Bruce R.; Kingsbury, Charles M.; Mungovan, John P.; and Mills, Elden H., 4,528,017, Cl. 65-240.000.
EMI Electrola Gesellschaft mit beschrankter Haftung: *See*—
Strausfeld, Hermann; and Kroenchen, Theo, 4,527,971, Cl. 425-409.000.
Emilsson, Fred S., to SAB Nife AB. Rail vehicle disc brake arrangement. 4,527,666, Cl. 188-33.000.
Emory, John E., Jr., to Big Jon, Inc. Trolling bar assembly. 4,527,349, Cl. 43-21.200.
Emoto, Takao; and Nagata, Yoshitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for quantitatively supplying liquid. 4,527,717, Cl. 222-593.000.
Emura, Junichi; Kanari, Issei; and Saito, Hideaki, to Atsugi Motor Parts Co., Ltd. Variable-damping-force shock absorber. 4,527,676, Cl. 188-299.000.
Ender, Erhard: *See*—
Straszewski, Klaus; Ender, Erhard; and Krutzfeldt, Herbert, 4,527,317, Cl. 24-641.000.
Endo, Kimikazu, to Omron Tateisi Electronics, Co. Personal identification system. 4,528,442, Cl. 235-379.000.

Energy Conversion Devices, Inc.: *See*—
McGill, John, 4,528,418, Cl. 136-256.000.
English, George J.: *See*—
Rothwell, Harold L., Jr.; and English, George J., 4,528,478, Cl. 313-631.000.
Ennerdal, Leif: *See*—
Sylven, Hans; Ennerdal, Leif; and Berg, Lars-Eije, 4,527,313, Cl. 24-464.000.
Enomoto, Mitsutaka: *See*—
Ishiguro, Mamoru; and Enomoto, Mitsutaka, 4,528,600, Cl. 360-14.100.
Enos, John F.: *See*—
LaConti, Anthony B.; Enos, John F.; Dempsey, Russell M.; and Fragala, Anthony R., 4,528,083, Cl. 204-265.000.
Eouzan, Jean-Yves, to Thomson-CSF. Line transfer imager and television camera including such an imager. 4,528,595, Cl. 358-213.000.
Eppolito, John: *See*—
Gentleman, Wally; and Eppolito, John, 4,527,872, Cl. 352-89.000.
Equipments Automobiles Marchal: *See*—
Guipaud, Serge, 4,527,524, Cl. 123-425.000.
Erdos, Adorjan: *See*—
Ghyczy, Miklos; Erdos, Adorjan; Heidemann, Gunter; and Ritzmann, Gotz, 4,528,193, Cl. 514-78.000.
Eschenbacher, Herbert: *See*—
Hollweck, Walter; Marz, Kurt; and Eschenbacher, Herbert, 4,528,541, Cl. 337-354.000.
Esmay, Edward N., to Bausch & Lomb Incorporated. Portable illuminated optical fiber microscope. 4,527,870, Cl. 350-523.000.
ESPE, Fabrik pharmazeutischer Praparate GmbH: *See*—
McLean, John W.; and Gasser, Oswald, 4,527,979, Cl. 433-228.000.
Espedal, Michael L., to Texaco Inc. Coal gasification apparatus. 4,527,997, Cl. 48-86.00R.
Essex, John D.: *See*—
Maurer, Edgar A.; and Essex, John D., 4,527,302, Cl. 15-325.000.
Essilor International Cie Generale d'Optique: *See*—
Sohyer, Jean-Pierre, 4,527,871, Cl. 351-106.000.
Esterling, Robert J.; Freed, Clarence L.; Weiss, Edward L.; and Korowitz, Simon, to General Signal Corporation. FSK modem for bidirectional loop communications system. 4,528,675, Cl. 375-9.000.
Etat Francais represente par le Ministere de l'Urganisme et du Logement Laboratoire Central des Ponts et Chaussees: *See*—
Abdunur, Charles S., 4,527,431, Cl. 73-803.000.
Ethicon, Inc.: *See*—
Mericle, Robert W., 4,527,562, Cl. 128-325.000.
Ethyl Corporation: *See*—
Nelson, Gunner E., 4,528,176, Cl. 423-644.000.
Ettlinger, Ralph; and Biela, John A., to Amco Corporation. Spray head assembly. 4,527,743, Cl. 239-530.000.
Evans, John H.; and Sabotta, Kenneth T., to ICI Americas Inc. Impact sensitive high temperature detonator. 4,527,481, Cl. 102-204.000.
Everett, Colvin K. Wood chipping assembly. 4,527,604, Cl. 144-176.000.
Ex-Cell-O Corporation: *See*—
Johnson, D. Dale, 4,527,458, Cl. 89-41.010.
Exxon Production Research Co.: *See*—
Rickey, Wynn P.; Dobson, Deborah H.; and Huffaker, Roger W., 4,528,041, Cl. 134-8.000.
Exxon Research and Engineering Co.: *See*—
Chang, Bong H.; and Ritchie, Joseph M., 4,528,088, Cl. 208-96.000.
Fiocco, Robert J.; and Niessen, Edward, 4,528,068, Cl. 196-14.520.
Moustakas, Theodore D.; and Maruska, H. Paul, 4,528,082, Cl. 204-192.00S.
Oswald, Alexis A.; Merola, Joseph S.; Reisch, John C.; and Kastrup, Rodney V., 4,528,404, Cl. 568-454.000.
Pecoraro, Theresa A.; and Chianelli, Russell R., 4,528,089, Cl. 208-216.00R.
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,528,348, Cl. 526-225.000.
Yeh, Chuen Y.; and Savini, Charles, 4,528,401, Cl. 568-408.000.
Fade-In Products Limited: *See*—
Cliffe, Nicholas R., 4,528,232, Cl. 428-195.000.
Fair, David L.; Justice, David D.; and Woodard, Kenneth E., Jr., to Olin Corporation. Membrane electrolytic cell for minimizing hypochlorite and chlorate formation. 4,528,077, Cl. 204-95.000.
Fairchild Camera and Instrument Corporation: *See*—
Chan, Kai Y., 4,527,907, Cl. 368-118.000.
Fairchild Industries, Inc.: *See*—
Renshaw, Theodore A., 4,527,727, Cl. 228-1.100.
Fairlamb, George R., to Union Carbide Canada Limited. Connector assembly for a gas. 4,527,587, Cl. 137-329.300.
Falcone, James S., Jr.: *See*—
Cambell, Thomas C.; Sherry, Howard S.; Schweiker, George C.; Falcone, James S., Jr.; and Sams, Robert H., deceased, 4,528,276, Cl. 502-62.000.
Fanslau, Udo; and Grosche, Norbert, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Foldable wheel chair, especially for invalids. 4,527,829, Cl. 297-17.000.
Farnham, William B., to Du Pont de Nemours, E. I., and Company. Pentacoordinate silyl enolates and their use as polymerization initiators. 4,528,389, Cl. 556-446.000.
Fasel, Herman P.: *See*—
Henniger, Peter W.; van der Drift, Johannes K.; Kapur, Jagdish C.; and Fasel, Herman P., 4,528,135, Cl. 260-245.20R.
Fatovic, Peter; and Lafrance, Conrad D., to Northern Telecom Limited. Directional microphone assembly. 4,528,426, Cl. 179-121.00D.
Feldmann, Ekkehard: *See*—
Daumer, Rolf; Feldmann, Ekkehard; Person, Martin; Wild, Ernst; and Zechnall, Martin, 4,527,523, Cl. 123-419.000.
Felter, John V.; and Campsmith, John G. Earth station antenna assembled on site. 4,528,569, Cl. 343-840.000.
Ferrari, Giorgio: *See*—
Vecchietti, Vittorio; Ferrari, Giorgio; and Casagrande, Cesare, 4,528,296, Cl. 514-346.000.
Ferrofluidics Corporation: *See*—
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Fiat Auto S.p.A.: *See*—
Dotti, Giulio; and Roggero, Bruno, 4,527,592, Cl. 137-625.610.
Parma, Giovanni; and Bartolomucci, Francesco, 4,527,739, Cl. 239-186.000.
Fiedler, Ronald D.: *See*—
Colvin, Howard A.; Fiedler, Ronald D.; Muse, Joel, Jr.; and Smith, Donald E., 4,528,413, Cl. 585-440.000.
Fifolt, Michael J.; and Forcucci, John, to Occidental Chemical Corporation. Non-flammable hydraulic fluids. 4,528,109, Cl. 252-78.100.
Figgie International Inc.: *See*—
Aoki, Akio, 4,527,287, Cl. 2-19.000.
Fikse, Douglas A., to Westinghouse Electric Corp. Recoilless electromagnetic projectile launcher. 4,527,457, Cl. 89-8.000.
Finn, Charles E.; Ruckey, Allan M.; and Shuler, David C., to General Motors Corporation. Fuel injection system. 4,527,528, Cl. 123-447.000.
Finn, William A.; and Searfass, Harry I., to Asten Group, Inc. Laminated soft faced-spiral woven papermakers fabric. 4,528,236, Cl. 428-222.000.
Fiocco, Robert J.; and Niessen, Edward, to Exxon Research and Engineering Co. Tray apparatus for deasphalting and extraction. 4,528,068, Cl. 196-14.520.
Firestone Tire & Rubber Company, The: *See*—
Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., 4,528,331, Cl. 525-313.000.
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; Verzella, David J.; and Sivigny, Arthur L., to United Technologies Corporation. Shutdown monitor for a helicopter pitch bias actuator. 4,528,628, Cl. 364-424.000.
Fischler, Henryk; Krupka, Yaakov; and Behar, Salamon, to Yeda Research & Development Company, Ltd. Method and apparatus for automatically evaluating the quality of the performance of a cardiac pacing system. 4,527,567, Cl. 128-419.0PT.
Fishburne, B. P., Jr.: *See*—
Braginetz, Paul A., 4,527,375, Cl. 52-712.000.
Fisher, Harry W.; and Hrivnak, Emil E., to Rockwell International Corporation. Compressed natural gas dispensing system. 4,527,600, Cl. 141-4.000.
Fisher, Julie M.; Tumminia, Dennis R.; and Behr, R. Douglas, to Dow Chemical Company, The. Closure for thermoplastic containers. 4,527,314, Cl. 24-587.000.
Fitts, Robert W.; and Smith, Edgar M., to RCA Corporation. Electrostatic shutter tube having substantially orthogonal pairs of deflection plates. 4,528,447, Cl. 250-213.0VT.
Flaig, Terrance L.; and Peterson, Gavrik, to Boeing Company, The. Controller for a brushless DC motor. 4,528,486, Cl. 318-254.000.
Fleming, David P., to United States of America, National Aeronautics and Space Administration. Dual clearance squeeze film damper. 4,527,910, Cl. 384-99.000.
Flesher, Peter: *See*—
Allen, Adrian S.; and Flesher, Peter, 4,528,321, Cl. 524-761.000.
Fletcher, Aaron N.: *See*—
McManis, George E., III; Miles, Melvin H.; and Fletcher, Aaron N., 4,528,253, Cl. 429-112.000.
Flick, Robert H.; and Huffman, Walter K., to Westinghouse Electric Corp. Molded case circuit breaker with improved operating mechanism. 4,528,531, Cl. 335-23.000.
Flint, Dennis H.; and Silverman, Richard B. Use of certain halogen-containing amino-acid compounds for controlling the growth of unwanted plants. 4,528,028. Cl. 71-113.000.
Flowers, Thomas. Apparatus for installing conduit. 4,527,775, Cl. 254-134.3FT.
Floyd, William M.; Webb, Nathaniel; and Juzswik, David L., to United Technologies Automotive, Inc. Multiplex control system having enhanced integrity. 4,528,662, Cl. 370-92.000.
Flynn, Robert J., to Du Pont de Nemours, E. I., and Company. Nonthermal expanding spool for carbon fiber oxidation. 4,527,754, Cl. 242-118.100.
FMC Corporation: *See*—
Plummer, Ernest L., 4,528,408, Cl. 568-808.000.
Ungchusri, Tep; and Jakubowski, William J., 4,527,806, Cl. 277-124.000.
Foley, Michael S.: *See*—
Petric, Paul F.; Foley, Michael S.; Utlaut, Mark W.; and Laiacano, Joseph A., 4,528,451, Cl. 250-441.100.
Fontanella, Luigi; Martinelli, Edoardo; and Assandri, Alessandro, to Gruppo Lepetit S.p.A. Neuroleptic 3-azetidinylethyl-1-phenyl-2-imidazolidinones. 4,528,297, Cl. 514-392.000.
FoodCraft Equipment Company, Inc.: *See*—
Martin, Eugene G.; and Risser, Dale M., 4,527,305, Cl. 17-11.300.
Foote, Kenneth G., to Micro Pure Systems, Inc. Ultrasonic particulate sensing. 4,527,420, Cl. 73-61.00R.
Forcucci, John: *See*—
Fifolt, Michael J.; and Forcucci, John, 4,528,109, Cl. 252-78.100.
Ford Aerospace & Communications Corporation: *See*—
Bostick, Hoyt A.; and Buczek, Carl J., 4,528,669, Cl. 372-26.000.

Ford Motor Company: *See—*
Dorner, Karlheinz; and Mohrholz, Kurt, 4,527,759, Cl. 248-73.000.
Gale, Ronald J., 4,527,682, Cl. 192-99.00S.
Hoffmann, Erwin; and Schneider, Josef, 4,527,442, Cl. 74-411.500.
Mourray, Jack W., 4,527,674, Cl. 188-284.000.
Person, Dennis W.; Pierce, Stanley L.; and Liang, Po-lung, 4,527,448, Cl. 74-869.000.
Pierce, Stanley L.; Brown, Larry T.; and Jain, Pramod K., 4,527,678, Cl. 192-3.580.
Theodore, Ares N.; and Chattha, Mohinder S., 4,528,317, Cl. 524-504.000.
Foreman, Mark M.: *See—*
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Forestier, Alexandre; and Joubert, Raymond J. M., to S.N.E.C.M.A. Device for locking a turbine rotor blade. 4,527,952, Cl. 416-220.00R.
Forsell, Kenneth A.; and Mallonen, Edward A., to Eaton Corporation. Reduced-size thermal overload relay. 4,528,539, Cl. 337-49.000.
Fort Wayne Truck Parts & Equipment, Inc.: *See—*
Eggeman, Vincent A.; Bubb, Jerome D.; Siegel, Harvey R.; and Wichman, Francis H., 4,527,684, Cl. 192-130.000.
Fortenberry, Durrel W. Round hay transporter. 4,527,935, Cl. 414-24.500.
Foslien, Floyd L., to Minnesota Mining and Manufacturing Company. Stapler with retractable anvil. 4,527,725, Cl. 227-19.000.
Fosslien, Egil, to Cortex Research Corporation. Automatic feed system for sampling apparatus. 4,527,438, Cl. 73-864.810.
Foster, James I.: *See—*
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,528,649, Cl. 367-36.000.
Foster, Joseph S., to Pro-Staff Overload Enterprises Limited. Dual fuel engine. 4,527,516, Cl. 123-27.0GE.
Fowler, Donald W.: *See—*
Bresie, Don A.; Burns, Jack M.; Fowler, Donald W.; and Sheets, Marion S., 4,527,816, Cl. 285-81.000.
Fox, Daniel J.: *See—*
Rubin, Fred K.; Van Blarcom, David; and Fox, Daniel J., 4,528,039, Cl. 134-2.000.
FPDC, Inc.: *See—*
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Fragala, Anthony R.: *See—*
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Fraser, Robert J., to Motorola, Inc. Tuning system for RF receiver. 4,528,698, Cl. 455-319.000.
Frear, David L.: *See—*
Gallusser, David O.; and Frear, David L., 4,527,851, Cl. 339-94.00M.
Frechtmann, Jean. Mosaic style artwork. 4,528,227, Cl. 428-49.000.
Free, David F. Photographic mounting process and composition. 4,528,233, Cl. 428-205.000.
Freed, Clarence L.: *See—*
Esterling, Robert J.; Freed, Clarence L.; Weiss, Edward L.; and Korowitz, Simon, 4,528,675, Cl. 375-9.000.
Freeman, Albert J. Seismic actuation system. 4,528,559, Cl. 340-690.000.
Freeny, Charles C., Jr., to FPDC, Inc. System for reproducing information in material objects at a point of sale location. 4,528,643, Cl. 364-900.000.
Freier, Hans-Joachim: *See—*
Fuhr, Karl; and Freier, Hans-Joachim, 4,528,307, Cl. 523-440.000.
Frey, Bernhard, to Hydrowatt Systems Limited. Cylinder-piston combination, particularly for high-pressure application. 4,527,464, Cl. 92-86.500.
Frey, Hartmut: *See—*
Dittrich, Hans; and Frey, Hartmut, 4,528,003, Cl. 55-158.000.
Fric, Premysl: *See—*
Kasafirek, Evzen; Fric, Premysl; Slaby, Jan; and Robalova, Alena, 4,528,133, Cl. 260-112.50R.
Frick, John P., to Mobil Oil Corporation. Use of electroless nickel coating to prevent galling of threaded tubular joints. 4,527,815, Cl. 285-55.000.
Friedman, Horace A., to United States of America, Energy. Separation of uranium from technetium in recovery of spent nuclear fuel. 4,528,165, Cl. 423-10.000.
Frielinghaus, Klaus H.: *See—*
Shahbaz, Zalmai S.; and Frielinghaus, Klaus H., 4,528,679, Cl. 377-6.000.
Fries, Hugo: *See—*
Dettinger, Willi; and Fries, Hugo, 4,527,957, Cl. 417-92.000.
Friese, Hans-Herbert; and Prinz, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of waterproof leathers and skins. 4,527,992, Cl. 8-94.210.
Fruechte, Roger D.: *See—*
Agarwal, Paul D.; Fruechte, Roger D.; Kade, Alexander; and Radomski, Thomas A., 4,527,653, Cl. 180-79.100.
Fruhauf, Waldemar, to Siemens Aktiengesellschaft. System for the transmission of information messages. 4,528,667, Cl. 371-55.000.
Fuchigami, Tadashi: *See—*
Nishida, Susumu; Fuchigami, Tadashi; Kimura, Seiji; Kishi, Shunsaku; and Kobayashi, Akio, 4,527,624, Cl. 165-184.000.
Fuerst, Erwin J. Sealing mat for hull breaches. 4,527,500, Cl. 114-229.000.
Fuhr, Karl; and Freier, Hans-Joachim, to Bayer Aktiengesellschaft. Radiation hardenable primer. 4,528,307, Cl. 523-440.000.
Fuji Fiber Glass Co., Ltd.: *See—*
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kasai, Yoshiaki; Hiraoka, Yasuo; Yuasa, Masaharu; Harada, Masataka; and Saito, Masao, 4,527,532, Cl. 123-520.000.
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Fuji Photo Film Co., Ltd.: *See—*
Ishiguro, Shoji; Mifune, Hiroyuki; Fuseya, Yoshiharu; and Kojima, Tetsuro, 4,528,264, Cl. 430-609.000.
Kitaguchi, Hiroshi; and Naito, Hideki, 4,528,258, Cl. 430-203.000.
Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, 4,528,085, Cl. 204-416.000.
Miyoshi, Takahito; Fujiyama, Masaaki; and Okutu, Toshimitu, 4,528,240, Cl. 428-323.000.
Fujikawa, Yoyu: *See—*
Nakagaki, Noboru; and Fujikawa, Yoyu, 4,527,404, Cl. 66-202.000.
Fujimoto, Takahiko: *See—*
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Fujimura, Masaaki: *See—*
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Fujioka, Atsushi: *See—*
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.
Fujioka, Futoshi: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,528,402, Cl. 568-445.000.
Fujioka, Yoshisato; and Kawamura, Atsushi, to Ricoh Company, Ltd. Wide angle zoom lens. 4,527,867, Cl. 350-427.000.
Fujisaki, Masaru: *See—*
Fujitaka, Nobuo; Fujisaki, Masaru; and Hagiwara, Yoshitoshi, 4,527,839, Cl. 301-63.0DD.
Fujita, Takafumi: *See—*
Yoshizawa, Toshikazu; and Fujita, Takafumi, 4,527,365, Cl. 52-67.000.
Fujita, Takeshi; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Water-soluble film or sheet. 4,528,360, Cl. 528-297.000.
Fujitaka, Nobuo; Fujisaki, Masaru; and Hagiwara, Yoshitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Synthetic wheel formed from two halves. 4,527,839, Cl. 301-63.0DD.
Fujitaki, Roy K.: *See—*
Gunzel, Rudolph M., Jr.; Wichman, William J.; and Fujitaki, Roy K., 4,527,740, Cl. 239-318.000.
Fujitsu Limited: *See—*
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.
Matsuda, Tadashi; Mizuno, Tsuneo; and Takada, Noboru, 4,528,575, Cl. 346-140.00R.
Fujiyama, Masaaki: *See—*
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Fukagawa, Yasuo: *See—*
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,528,397, Cl. 514-400.000.
Fukao, Satoshi: *See—*
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Fukuda, Takeshi; and Yumoto, Satoshi, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a shaped article of cured silicone rubber. 4,528,156, Cl. 264-236.000.
Fukuoka, Yohei: *See—*
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Fulcomer, Emanuel J., Jr., to AT&T Bell Laboratories. Button depression click generator. 4,528,681, Cl. 377-16.000.
Fullbright, Olen E.; Baird, Truette H.; and Wade, Jack H., to Hosiery Maufacturing Corp. of Morganton. Circular knit panty and method. 4,527,403, Cl. 66-177.000.
Funada, Fumiaki: *See—*
Ishii, Yutaka; Minezaki, Shigehiro; Kozaki, Shuichi; and Funada, Fumiaki, 4,528,115, Cl. 252-299.630.
Fuseya, Yoshiharu: *See—*
Ishiguro, Shoji; Mifune, Hiroyuki; Fuseya, Yoshiharu; and Kojima, Tetsuro, 4,528,264, Cl. 430-609.000.
Fushiya, Fusao; Inoue, Nobuhiro; and Saito, Setsuo, to Makita Electric Works, Ltd. Lawn mower. 4,527,380, Cl. 56-12.800.
Fuss, Larry N.: *See—*
MacNitt, Donald G., Jr.; and Fuss, Larry N., 4,527,410, Cl. 72-306.000.
Futami, Ryuhei: *See—*
Yokogawa, Tetsuya; Futami, Ryuhei; and Kawahara, Saburo, 4,528,001, Cl. 55-37.000.
Futami, Toru: *See—*
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Fyfe, Donald W.; and Hoyt, Franklin S., to Solar Decisions, Inc. Solar energy storage and distribution system with heat pump assist. 4,527,618, Cl. 165-18.000.

G. B. Boucherie, Firma: *See*—
Boucherie, Leonel P., 4,527,838, Cl. 300-7.000.

G-C Dental Industrial Corp.: *See*—
Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, 4,528,034, Cl. 75-255.000.

GA Technologies Inc.: *See*—
Purcell, John R., 4,528,609, Cl. 361-19.000.

Gabard, Bernard L.: *See*—
Jaggy, Hermann E. W.; Chatterjee, Shyam S.; and Gabard, Bernard L., 4,528,289, Cl. 514-285.000.

Gabbay, Shlomo, to Shelhigh Inc. Method of and means for intraaortic assist. 4,527,549, Cl. 128-1.00D.

Gadian, David G.: *See*—
Radda, George K.; Waterton, John C.; and Gadian, David G., 4,528,509, Cl. 324-309.000.

Gadonna, Michel P.; and Kastler, Joel R. Test system and device for locating short circuits and open circuits in a two-lead line. 4,528,427, Cl. 179-175.30F.

GAF Corporation: *See*—
Richardson, John J., 4,527,509, Cl. 418-650.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Inhibition of plaque/-gingivitis with polyvinyl phosphonic acid. 4,528,179, Cl. 424-49.000.

Gaffre, Michel: *See*—
Kleinhans, Michel; and Gaffre, Michel, 4,528,062, Cl. 156-611.000.

Gagne, Robert; and Tsai, Yih-Wan, to PPG Industries, Inc. Regenerator checker packing with enhanced transverse flow. 4,527,617, Cl. 165-9.400.

Gaiser, Robert F.; and Lohraff, Larry G., to Allied Corporation. Master cylinder. 4,527,395, Cl. 60-562.000.

Gaither, Dolphard. Tire tool. 4,527,607, Cl. 157-1.300.

Galbraith, Andrew D., to Lockheed Missiles & Space Company, Inc. Electrochemical cell and method. 4,528,248, Cl. 429-8.000.

Galbraith, Andrew D., to Lockheed Missiles & Space Company, Inc. Electrochemical cell and method. 4,528,249, Cl. 429-15.000.

Gale, Ronald J., to Ford Motor Company. Adjustable clutch pedal stop. 4,527,682, Cl. 192-99.00S.

Gallaro, Anthony V., to North American Philips Consumer Electronics Corp. CRT with optical window. 4,528,477, Cl. 313-479.000.

Gallati, Marvin L.: *See*—
Nelson, Hilding E.; Nesdahl, Myron A.; and Gallati, Marvin L., 4,528,458, Cl. 307-64.000.

Gallusser, David O.; and Frear, David L., to Allied Corporation. Electrical connector assembly having an interfacial seal. 4,527,851, Cl. 339-94.00M.

Galster, Hans-Peter; and Despot, Janko, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink metering device. 4,527,477, Cl. 101-365.000.

Gamblin, Rodger L., to Burlington Industries, Inc. Orifice plate constructions. 4,528,070, Cl. 204-11.000.

Gardner, Beth A.: *See*—
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,528,376, Cl. 546-198.000.

Gardner, William J.: *See*—
Tobey, William H.; Coyner, John V.; and Gardner, William J., 4,527,362, Cl. 52-71.000.

Garneau, Richard P., to AFA Corporation, The. Check valve. 4,527,594, Cl. 137-854.000.

Garneau, Richard P., to AFA Corporation, The. Trigger pump sprayer. 4,527,741, Cl. 239-333.000.

Garner, Edward D. Dressing tool for grinding wheels. 4,527,537, Cl. 125-11.0TP.

Garrett Corporation, The: *See*—
Wallace, Frank B., Jr., 4,527,388, Cl. 60-204.000.

Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., to Chevron Research Company. Exploration system for discovering deposits of ore, marker rock and/or economic minerals. 4,528,649, Cl. 367-36.000.

Gasser, Oswald: *See*—
McLean, John W.; and Gasser, Oswald, 4,527,979, Cl. 433-228.000.

Gauckler, Lugwig: *See*—
Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, 4,528,099, Cl. 210-489.000.

Gaul, James M.: *See*—
Nguyen, Tinh; and Gaul, James M., 4,528,154, Cl. 264-109.000.

Gauthier, Emile: *See*—
Sweet, Richard H.; Baker, Thomas J.; Stickel, Erick E.; and Gauthier, Emile, 4,527,315, Cl. 24-615.000.

Gazda, Chester T.: *See*—
Desilets, Norman H.; Gazda, Chester T.; and Zamachaj, Richard A., 4,527,819, Cl. 285-287.000.

GBF, Inc.: *See*—
Upchurch, Billy T., 4,528,301, Cl. 523-107.000.

GCA Corporation: *See*—
Juodikis, Peter; and Martinich, Steven J., 4,528,635, Cl. 364-501.000.

Gdanski, Ricky D.: *See*—
Dill, Walter R.; and Gdanski, Ricky D., 4,527,628, Cl. 166-295.000.

Geipel, Henry J., Jr.; Schaefer, Charles A.; White, Francis R.; and Wurstthorn, John M., to International Business Machines Corporation. Process for fabricating semiconductor devices utilizing a protective film during high temperature annealing. 4,527,325, Cl. 29-571.000.

Gell, Maurice L.; and Giamei, Anthony F., to United Technologies Corporation. Mechanically worked single crystal article. 4,528,048, Cl. 148-404.000.

GemDialogue Systems, Inc.: *See*—
Rubin, Howard, 4,527,895, Cl. 356-30.000.

Gencarelli, Richard A.; and Wheeler, Edward L., to Uniroyal, Inc. Process for making triazoles. 4,528,381, Cl. 548-257.000.

General Electric Company: *See*—
Anderson, John M.; and Johnson, Peter D., 4,528,209, Cl. 427-67.000.
Becker, Joseph J.; Luborsky, Fred E.; Jacobs, Israel S.; and McCary, Richard O., 4,528,481, Cl. 315-248.000.
Bloomer, Milton D., 4,528,494, Cl. 323-237.000.
Boyd, John H., Jr., 4,528,485, Cl. 318-138.000.
Burnett, Jesse W.; and Hall, Homer H., 4,528,437, Cl. 219-85.0CA.
Chung, Rack H.; Lucas, Gary M.; and Liermann, August O., 4,528,324, Cl. 524-863.000.
Chung, Rack H., deceased, 4,528,352, Cl. 528-18.000.
Cohen, Simon S.; and Ghezzo, Mario, 4,528,582, Cl. 357-51.000.
Cooper, Glenn D.; and Katchman, Arthur, 4,528,327, Cl. 525-68.000.
Harris, Dewey L., 4,528,456, Cl. 307-31.000.
Heitman, Christopher J.; and Schwehr, Gregory D., 4,527,440, Cl. 74-10.00R.
Hodge, James D., 4,528,275, Cl. 501-9.000.
Horner, Michael S.; Brisken, Axel F.; and Zanelli, Claudio I., 4,528,652, Cl. 367-162.000.
Keim, Thomas A., 4,528,532, Cl. 335-216.000.
Knemeyer, Friedel S., 4,527,998, Cl. 51-309.000.
Kump, Howard H.; and Collins, William F., 4,528,685, Cl. 378-157.000.
Lastrina, Frank A.; Pommer, Leslie M.; and Mayer, Jeffrey C., 4,527,387, Cl. 60-39.092.
Lucas, Gary M.; and Dziark, John J., 4,528,353, Cl. 528-21.000.
Martin, Robert J., III, 4,528,696, Cl. 455-73.000.
Modic, Frank J., 4,528,314, Cl. 524-407.000.
Robbins, Alexander G., 4,528,671, Cl. 372-68.000.
Rocha, Henry A. F., 4,528,502, Cl. 324-117.00R.
Smith, William E.; and Battista, Richard A., 4,528,407, Cl. 568-804.000.
Williams, Arlene G., 4,528,038, Cl. 106-287.130.
Zarchy, Andrew S., 4,528,100, Cl. 210-634.000.

General Motors Corporation: *See*—
Agarwal, Paul D.; Fruechte, Roger D.; Kade, Alexander; and Radomski, Thomas A., 4,527,653, Cl. 180-79.100.
Baker, Steven F., 4,527,406, Cl. 70-165.000.
Barnett, Ronald R., 4,527,835, Cl. 297-482.000.
Bhagat, Jayant K., 4,528,211, Cl. 427-88.000.
Borman, August H., 4,527,958, Cl. 417-213.000.
Bridgewater, Bobbie D.; and Young, Robert E., 4,527,986, Cl. 464-73.000.
Clouse, Clarence, 4,527,825, Cl. 296-1.00C.
Deckard, John L., 4,527,737, Cl. 239-89.000.
Finn, Charles E.; Ruckey, Allan M.; and Shuler, David C., 4,527,528, Cl. 123-447.000.
Groce, James S.; and Sabo, Edward A., 4,527,828, Cl. 296-65.00R.
Gutterman, Jeffrey S., 4,527,432, Cl. 73-861.280.
Gutterman, Jeffrey S., 4,527,433, Cl. 73-861.280.
Klusman, Steven A., 4,527,912, Cl. 384-99.000.
Kopich, Leonard F., 4,527,822, Cl. 292-257.000.
Lopez-Crevillen, Jose M., 4,527,710, Cl. 220-378.000.
Mar, Henry M.; and Reider, Samuel B., 4,527,390, Cl. 60-224.000.
McFadden, James R., 4,527,812, Cl. 280-402.000.
Ottaviani, Robert A.; Short, William T.; and Hart, Donald J., 4,528,319, Cl. 524-540.000.
Pees, James M.; and Neubauer, Jerry L., 4,527,781, Cl. 267-64.240.
Rees, Richard W. A., 4,527,767, Cl. 248-419.000.
Roof, James A., 4,527,860, Cl. 350-281.000.
Stapleton, Thomas T., 4,527,898, Cl. 356-446.000.
Van Duyn, Paul D., 4,527,861, Cl. 350-281.000.
Zyngier, John F., 4,527,834, Cl. 297-410.000.

General Scanning, Inc.: *See*—
Montagu, Jean I., 4,528,533, Cl. 335-230.000.

General Signal Corporation: *See*—
Day, Lawrence, 4,527,358, Cl. 51-131.300.
DeSisto, Richard E., 4,527,960, Cl. 417-368.000.
Esterling, Robert J.; Freed, Clarence L.; Weiss, Edward L.; and Korowitz, Simon, 4,528,675, Cl. 375-9.000.
Shahbaz, Zalmai S.; and Frielinghaus, Klaus H., 4,528,679, Cl. 377-6.000.
Weetman, Ronald J., 4,527,904, Cl. 366-348.000.
Young, John E. G., 4,527,393, Cl. 60-327.000.

Genovation, Inc.: *See*—
Sedgwick, Jim, 4,528,690, Cl. 381-67.000.

Gentleman, Wally; and Eppolito, John. Composite process cinematography system and method. 4,527,872, Cl. 352-89.000.

Gentry, James F., to United States of America, Air Force. Multiplexed data stream monitor. 4,528,660, Cl. 370-80.000.

George, Marion L.: *See*—
Kebede, Berhanu; and George, Marion L., 4,527,772, Cl. 251-138.000.

Geosling, Christine E.: *See*—
Donohue, Terence; and Geosling, Christine E., 4,528,080, Cl. 204-157.10R.

Gerakiteys, Peter K. Levitated ball toy. 4,527,351, Cl. 446-202.000.

Gerson, Philips M.: *See*—
Stiekel, Jan J.; Hagen, Marinus; Prins, Klaas H.; and Gerson, Philips M., 4,528,540, Cl. 337-102.000.

Geschonke, Hans: *See*—
Kreilein, Kurt; Geschonke, Hans; Rummel, Wolfgang; and Wiemer, Hardo, 4,528,337, Cl. 526-70.000.

Geyer, Christoph; and Baader, Bernd, to Geyer-Werke GmbH. Method for transferring optically produced picture records to a magnetic record support and apparatus for performing the method. 4,528,570, Cl. 346-74.200.

Geyer-Werke GmbH: *See*—
Geyer, Christoph; and Baader, Bernd, 4,528,570, Cl. 346-74.200.

Ghafari, Joseph; and Land, Herbert K., III. Cosmetic orthodontic device. 4,527,975, Cl. 433-8.000.

Ghezzo, Mario: *See*—
Cohen, Simon S.; and Ghezzo, Mario, 4,528,582, Cl. 357-51.000.

Ghougasian, John N. Re-register anchors for film sheet. 4,527,889, Cl. 355-77.000.

Ghyczy, Miklos; Erdos, Adorjan; Heidemann, Gunter; and Ritzmann, Gotz, to A. Natterman & Cie. GmbH. Inflammation-preventing pharmaceutical composition of oral administration. 4,528,193, Cl. 514-78.000.

Giamei, Anthony F.: *See*—
Gell, Maurice L.; and Giamei, Anthony F., 4,528,048, Cl. 148-404.000.

Giavelli, Giordano: *See*—
Carraroli, Dario; and Giavelli, Giordano, 4,527,974, Cl. 432-78.000.

Gibson, Jack E. Postive seal steel coupling apparatus and method. 4,527,820, Cl. 285-382.200.

Giladett, Leo V. B.: *See*—
Baird, Richard H.; Blechar, Theodore J.; Giladett, Leo V. B.; Horner, Reginald M.; Prouty, Gerald G.; and Rinde, David L., 4,527,623, Cl. 165-173.000.

Gilbert, Serge. Water skis and oaring sticks. 4,527,984, Cl. 441-76.000.

Gill, Dee R.; and Marks, Rex B., to Hercules Incorporated. Apparatus for winding of filamentary composites. 4,528,060, Cl. 156-432.000.

Gill, Peter R., to AMF Incorporated. Jig for stitching fabric layers in a sewing machine. 4,527,492, Cl. 112-121.120.

Gilles, Pieter; and Schmitt, Jean-Claude, to Baird Corporation. Automatic sampling system. 4,528,158, Cl. 422-63.000.

Gist-Brocades N.V.: *See*—
Henniger, Peter W.; van der Drift, Johannes K.; Kapur, Jagdish C.; and Fasel, Herman P., 4,528,135, Cl. 260-245.20R.

GIW Industries, Inc.: *See*—
Addie, Graeme R., 4,527,948, Cl. 415-128.000.

Glashauser, Walter, to Siemens Aktiengesellschaft. Process for the production of masks having a metal carrier foil. 4,528,071, Cl. 204-11.000.

Glasper, John L.; Shanks, Ian A.; and Clark, Michael G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Electronic displays. 4,527,863, Cl. 350-336.000.

Glass, John P.: *See*—
Hollander, Edward F., Jr., 4,527,687, Cl. 206-219.000.

GNS Gesellschaft fur Nuklear-Service mbH: *See*—
Baatz, Henning; Ritsscher, Dieter; and Wriegt, Jurgen, 4,528,454, Cl. 250-506.100.

Goede, Simon; Hauser, Peter; and Mira, Silvio, to Zellweger Uster Ltd. Method and apparatus for measuring the velocity of moved objects or the like. 4,527,894, Cl. 356-28.000.

Goi, Koichi: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,527,845, Cl. 312-215.000.

Goksel, Mehmet A., to Michigan Technological University, Board of Control of. Self-reducing iron oxide agglomerates. 4,528,029, Cl. 75-3.000.

Gold, Kenneth S.: *See*—
Dorrough, Michael L.; and Gold, Kenneth S., 4,528,501, Cl. 324-103.00P.

Goldstein, Richard M. Combination carrying sled and beach umbrella. 4,527,721, Cl. 224-151.000.

Golf-Eze, Inc.: *See*—
Savard, Hassel J., Jr., 4,527,652, Cl. 180-19.300.

Gonzales, Gilbert R.; and La Monica, John A., Jr. Lift generating mechanism for an aircraft. 4,527,757, Cl. 244-20.000.

Goodwin, Anton E.; Marton, Janet L.; Owens, Robert M.; Whisenhunt, Jackie W.; and Swain, Roy D., to Conoco Inc. Distillation apparatus. 4,528,162, Cl. 422-101.000.

Goodyear Tire & Rubber Company, The: *See*—
Colvin, Howard A.; Fiedler, Ronald D.; Muse, Joel, Jr.; and Smith, Donald E., 4,528,413, Cl. 585-440.000.

Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, to Chemische Fabrik Stockhausen & Cie. Polymers of α,β-unsaturated N-substituted carboxylic acid amides. 4,528,350, Cl. 526-307.000.

Gople-Pack and Industrial Marketing ApS: *See*—
Skovgaard, Leif O., 4,528,694, Cl. 383-10.000.

Gordon, William R.; and Nicholson, Peter N., to Honeywell Inc. Detector dewar assembly. 4,528,449, Cl. 250-352.000.

Gossage, Henry E. Electrochemical oxidation synthesis of bis-(5,5') -8 -Anilino -1-naphthalene Sulfonate (bis-Ans). 4,528,076, Cl. 204-78.000.

Gote, Helgesson; Bjorn, Mansson; and Nils-Hakan, Wallin, to AB Casco. Method for the production of cellulosic board materials. 4,528,309, Cl. 524-13.000.

Goto, Yoshiharu: *See*—
Kita, Toshio; Ikeda, Nobumasa; Takusagawa, Takashi; Goto, Yoshiharu; Hayakawa, Hiroshi; and Togashi, Minoru, 4,527,606, Cl. 152-209.00R.

Gotoda, Katsuhiko: *See*—
Inamori, Kazuo; and Gotoda, Katsuhiko, 4,527,886, Cl. 355-3.00R.

Gotoh, Hideo; Fukao, Satoshi; and Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Key-holding structure of keyboard with curved operating surface of keys. 4,528,428, Cl. 200-5.00A.

Gottlieb, Willi. Camouflage material for use as protection against radar observation. 4,528,229, Cl. 428-85.000.

Gowda, Hanumaiah L.; and Raj, Kuldip, to Ferrofluidics Corporation. High-pressure ferrofluid seal apparatus. 4,527,805, Cl. 277-80.000.

Graaff, Kommanditgesellschaft: *See*—
Dorpmund, Willi; and Kreienbrink, Volker, 4,527,765, Cl. 248-346.000.

Graham, John W.; and Sinclair, A. Richard, to Santrol Products, Inc. Method of acidizing propped fractures. 4,527,627, Cl. 166-280.000.

Graham, Neil B., to National Research Development Corporation. Hydrogels. 4,528,365, Cl. 528-392.000.

Grant, Richard W.; and Sciulli, Ronald D., to Atecs Corporation. Adjustable mast step. 4,527,499, Cl. 114-39.000.

Graphic Arts Technical Foundation: *See*—
Warner, Richard D., 4,527,333, Cl. 33-1.00B.

Graphic Resources, Inc.: *See*—
Hattemer, James C., 4,528,055, Cl. 156-247.000.

Gras, Rainer; and Riemer, Heinz, to Chemische Werke Huls Aktiengesellschaft. Powder varnishes based on partially blocked isophorone diisocyanate isocyanurate and hydroxyl group containing polyester, and method for producing matte coatings. 4,528,355, Cl. 528-45.000.

Graves, Alan F.; and Dilley, James E., to Northern Telecom Limited. Method and apparatus for code conversion of binary of multilevel signals. 4,528,550, Cl. 340-347.0DD.

Gray, Stanley: *See*—
Wilcock, Donald F.; and Gray, Stanley, 4,527,802, Cl. 277-1.000.

Greene, David A.: *See*—
Greene, Paul S.; and Greene, David A., 4,527,366, Cl. 52-184.000.

Greene, Paul S.; and Greene, David A., to Greene Welding and Hardware, Inc. Curvilinear stairway constructions. 4,527,366, Cl. 52-184.000.

Greene Welding and Hardware, Inc.: *See*—
Greene, Paul S.; and Greene, David A., 4,527,366, Cl. 52-184.000.

Greenheck, Donald W.; and Anderson, Lowell M., to Westinghouse Electric Corp. Air shutter arrangement for transport refrigeration unit. 4,527,400, Cl. 62-239.000.

Grelan Pharmaceutical Co., Ltd.: *See*—
Kigasawa, Kazuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, 4,528,372, Cl. 544-310.000.

Grimes, Gary J., to AT&T Information Systems Inc. Precision control frequency synthesizer having an unstable, variable frequency input signal. 4,528,521, Cl. 331-1.00A.

Griplite, S.L.: *See*—
Lopez Lopez, Julio, 4,527,345, Cl. 36-127.000.

Groce, James S.; and Sabo, Edward A., to General Motors Corporation. Side mounted jump seat for an automotive vehicle. 4,527,828, Cl. 296-65.00R.

Grolitzer, Marilyn A., to Olin Corporation. Glucoside surfactants. 4,528,106, Cl. 252-8.55D.

Grosche, Norbert: *See*—
Fanslau, Udo; and Grosche, Norbert, 4,527,829, Cl. 297-17.000.

Gross, Winthrop A., to Tektronix, Inc. High frequency differential amplifier with adjustable damping factor. 4,528,515, Cl. 330-254.000.

Grossstuck, Werner; and Schafer, Rainer, to NUSTEP Trenndusen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG. Element for separating gaseous isotopes into at least two fractions and with a separating basket consisting of several separating elements. 4,528,007, Cl. 55-395.000.

Grosz, Edward G.; and Herrington, F. John, to Mobil Oil Corporation. Universal dancer speed control. 4,527,751, Cl. 242-75.510.

Grover, Kent B., to Lubrizol Corporation, The. Method for cooling internal combustion engine with an oleaginous coolant fluid composition. 4,528,108, Cl. 252-75.000.

Grumman Aerospace Corporation: *See*—
Colliora, George A.; and Braun, Ronald C., 4,527,783, Cl. 269-21.000.

Grundig E.M.V.: *See*—
Klein, Walter; and Mangold, Hans, 4,528,597, Cl. 358-254.000.

Grunwald, Werner, to Robert Bosch GmbH. Device for determining the flow rate of a flowing medium. 4,527,427, Cl. 73-204.000.

Gruppo Lepetit S.p.A.: *See*—
Fontanella, Luigi; Martinelli, Edoardo; and Assandri, Alessandro, 4,528,297, Cl. 514-392.000.

GTE Automatic Electric Inc.: *See*—
Koppensteiner, James V., 4,528,616, Cl. 361-399.000.

GTE Laboratories Incorporated: *See*—
Sanchez, Jaime; and Sarin, Vinod K., 4,527,638, Cl. 175-57.000.
Sarin, Vinod K., 4,527,931, Cl. 407-113.000.

GTE Products Corporation: *See*—
Bonazoli, Robert P.; and Shaffer, John W., 4,528,479, Cl. 315-73.000.
Dolan, Richard J.; Cangiano, Frank; and Van der Linde, John, 4,528,619, Cl. 362-61.000.
Mizuhara, Howard, 4,528,247, Cl. 428-606.000.
Rothwell, Harold L., Jr.; and English, George J., 4,528,478, Cl. 313-631.000.

Guidat, Gilbert R. Method of manufacturing heat insulating aggregates or pellets and product thus obtained. 4,528,037, Cl. 106-81.000.

Guipaud, Serge, to Equipments Automobiles Marchal. Method and device to vary the ignition timing angle to avoid pinging in an internal combustion engine. 4,527,524, Cl. 123-425.000.

Gunjima, Tomoki: *See*—
Asawa, Tatsuro; Ishii, Tsuneji; and Gunjima, Tomoki, 4,528,058, Cl. 156-306.600.

Gunzel, Rudolph M., Jr.; Wichman, William J.; and Fujitaki, Roy K., to Chevron Research Company. Hose-end aspirator sprayer. 4,527,740, Cl. 239-318.000.

Gupta, Tapan K.: *See*—
Blewitt, Donald D.; and Gupta, Tapan K., 4,528,537, Cl. 337-5.000.

Gustafson, Gary R. Window blind type solar collector. 4,527,548, Cl. 126-448.000.

Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Terpene sulfonate hydrotropes. 4,528,144, Cl. 260-503.000.

Gutterman, Jeffrey S., to General Motors Corporation. Dual frequency acoustic fluid flow method and apparatus. 4,527,432, Cl. 73-861.280.

Gutterman, Jeffrey S., to General Motors Corporation. Method and apparatus for measuring fluid flow. 4,527,433, Cl. 73-861.280.

H. W. Andersen Products Inc.: *See*—
Andersen, Harold W.; and Harrison, Charles H., 4,528,268, Cl. 435-31.000.

Haarmann & Reimer GmbH: *See*—
Sturm, Wolfgang; Mansfeld, Gerd; and Reindl, Hans, 4,528,124, Cl. 252-522.00R.

Haas, Louis M.; Williams, Joy L.; and Smith, Boyd E., to Cargill, Incorporated. Apparatus for dispensing material from a bag. 4,527,716, Cl. 222-83.500.

Habon, Ilona: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.

Hacetoglu, Ararat; and Kodatsky, William K., to Cyanamid Canada, Inc. Flow promotor for particulate material. 4,528,031, Cl. 75-53.000.

Hacker, Heinz: *See*—
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,528,358, Cl. 528-94.000.

Haeg, Steven R.; and LaCroix, Michael G., to MTS Systems Corporation. Vehicle restraint system. 4,527,416, Cl. 73-11.000.

Hafner, Udo; Krauss, Rudolf; and Langer, Werner, to Robert Bosch GmbH. Electromagnetically actuatable valve. 4,527,744, Cl. 239-585.000.

Hagbjer, Gunnar, to IFM-Akustikbyran AB. Structural damping. 4,527,371, Cl. 52-309.160.

Hagen, Marinus: *See*—
Stiekel, Jan J.; Hagen, Marinus; Prins, Klaas H.; and Gerson, Philips M., 4,528,540, Cl. 337-102.000.

Hagiwara, Kunio: *See*—
Yoshimura, Tokuo; Hagiwara, Kunio; and Aiba, Akira, 4,528,304, Cl. 523-216.000.

Hagiwara, Michiaki: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Hagiwara, Michiaki; and Yasuhara, Kiyomi, 4,527,614, Cl. 164-463.000.

Hagiwara, Yoshitoshi: *See*—
Fujitaka, Nobuo; Fujisaki, Masaru; and Hagiwara, Yoshitoshi, 4,527,839, Cl. 301-63.0DD.

Hakoyama, Akiyoshi: *See*—
Sasaki, Akira; Mashiko, Kazuyuki; Saitoh, Shouji; and Hakoyama, Akiyoshi, 4,528,572, Cl. 346-76.0PH.

Hall, Homer H.: *See*—
Burnett, Jesse W.; and Hall, Homer H., 4,528,437, Cl. 219-85.0CA.

Hall, James E.: *See*—
Bohm, Georg G. A.; DeTrano, Mario; and Hall, James E., 4,528,331, Cl. 525-313.000.

Hall, Kenneth R.; and Holste, James C., to Precision Machine Products, Inc. Channeled plug proportional flow sampler. 4,527,435, Cl. 73-863.030.

Halliburton Company: *See*—
Dill, Walter R.; and Gdanski, Ricky D., 4,527,628, Cl. 166-295.000.
Hester, Lawrence R., II, 4,527,515, Cl. 122-392.000.
Murali, Beegamudre N.; Rosenberg, Jeffrey S.; and Cole, Clinton W., 4,527,954, Cl. 417-46.000.

Hamada Printing Press Mfg. Co., Ltd.: *See*—
Masuda, Itsuro, 4,527,788, Cl. 270-21.100.

Hamada, Tooru; Tanaka, Hirohisa; and Ishihara, Tomoo, to Kabushiki Kaisha Daikin Seisakusho. Electro-pneumatic clutch control valve. 4,527,679, Cl. 192-3.580.

Hamamoto, Kiyoshi: *See*—
Yano, Masatoshi; and Hamamoto, Kiyoshi, 4,527,586, Cl. 137-318.000.

Hamashima, Toyoji: *See*—
Nio, Satoru; Sato, Shinobu; Nobayashi, Shigemi; and Hamashima, Toyoji, 4,528,632, Cl. 364-169.000.

Hancor, Inc.: *See*—
Rosenbaum, Larry A.; and Sidaway, H. John, 4,527,319, Cl. 29-33.00T.

Handels, Johannes W. H.: *See*—
Polderman, Arie; Handels, Johannes W. H.; and Kuit, Johannes H., 4,528,257, Cl. 430-109.000.

Hanna, Marie R.: *See*—
Boden, Richard M.; Hanna, Marie R.; and Tyrrkiewicz, Theodore J., 4,528,142, Cl. 260-463.000.

Hannebaum, Manfred: *See*—
Eck, Herbert; Hannebaum, Manfred; and Kemenater, Christof, 4,528,315, Cl. 524-458.000.

Hansen, Siegfried, to Hughes Aircraft Company. Two axis drive for stage. 4,528,490, Cl. 318-560.000.

Hansen, Thomas C. Electronically controlled motor assembly. 4,528,484, Cl. 318-135.000.

Hantos, Gabor: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.

Hara, Masahiro; and Sakai, Toshiyasu, to Nippondenso Co., Ltd. Optical reading apparatus with automatic gain control circuit. 4,528,444, Cl. 235-462.000.

Harada, Masataka: *See*—
Kasai, Yoshiaki; Hiraoka, Yasuo; Yuasa, Masaharu; Harada, Masataka; and Saito, Masao, 4,527,532, Cl. 123-520.000.

Harada, Susumu; and Shimizu, Kiyoshi, to 501 Nitto Boseki, Co. Ltd. Process for producing polymers of monoallylamine. 4,528,347, Cl. 526-219.000.

Harada, Takashi: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,528,004, Cl. 55-158.000.

Harao, Norio: *See*—
Noji, Takashi; Harao, Norio; and Obata, Yoshiharu, 4,528,210, Cl. 427-70.000.

Hargrave, Franklin: *See*—
Middleton, Francisco A.; Das, Santanu; and Hargrave, Franklin, 4,528,424, Cl. 179-17.00A.

Harley-Davidson Motor Co., Inc.: *See*—
Mezger, Hans; Konneker, Reinhard; and Kelm, Joachim, 4,527,517, Cl. 123-41.470.

Harrell, Bob G., to News Vend 1, Inc. Vending machine for edge engaging and dispensing single article. 4,527,711, Cl. 221-244.000.

Harrington, Daniel L., to J. I. Case Company. Thermally-responsive muffler drainhole valve mechanism. 4,527,659, Cl. 181-244.000.

Harris Corporation: *See*—
Morais, Douglas H., 4,528,656, Cl. 370-30.000.
Shackle, Peter W.; and Pospisil, Robert S., 4,528,461, Cl. 307-252.00L.
Shackle, Peter W.; and Pospisil, Robert S., 4,528,462, Cl. 307-252.00L.
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,528,504, Cl. 324-158.00F.

Harris, Dewey L., to General Electric Company. Dual load control circuit. 4,528,456, Cl. 307-31.000.

Harris, Jimmy G.; and Harris, Olen R. Automobile beverage holder. 4,527,696, Cl. 211-86.000.

Harris, Olen R.: *See*—
Harris, Jimmy G.; and Harris, Olen R., 4,527,696, Cl. 211-86.000.

Harris, Peter; and Yoell, Richard W., to Lever Brothers Company. Process preparation of soluble protein and use. 4,528,203, Cl. 426-555.000.

Harrison, Charles H.: *See*—
Andersen, Harold W.; and Harrison, Charles H., 4,528,268, Cl. 435-31.000.

Harrison, Thomas L.: *See*—
Hunt, Stuart B. D.; Chandler, Philip B.; and Harrison, Thomas L., 4,528,056, Cl. 156-253.000.

Harrison Western Corporation: *See*—
Snyder, Larry L., 4,527,837, Cl. 299-31.000.

Harroun, Hugh. Ball nose end cutting tool. 4,527,930, Cl. 407-42.000.

Hart, Donald J.: *See*—
Ottaviani, Robert A.; Short, William T.; and Hart, Donald J., 4,528,319, Cl. 524-540.000.

Hart, Felix; and Eby, Devon, to CTB, Inc. Poultry waterer. 4,527,513, Cl. 119-51.500.

Hartlieb, Dieter, to Audi Nsu Auto Union Aktiengesellschaft. Automatic plant for stacking sheet metal pressings. 4,527,936, Cl. 414-47.000.

Harvey, Barry, to Advanced Micro Devices, Inc. Semiconductor circuit alternately operative as a data latch and a logic gate. 4,528,465, Cl. 307-454.000.

Harvey, John M.: *See*—
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., 4,528,035, Cl. 75-257.000.

Harvey, Kenneth: *See*—
Morton, Anthony J.; Harvey, Kenneth; and Hayes, Harry, 4,528,181, Cl. 424-52.000.

Harville, John D.: *See*—
McLaughlin, Stephen J.; Harville, John D.; and Blair, Gary S., 4,527,914, Cl. 384-428.000.

Hasebe, Takashi: *See*—
Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, 4,528,074, Cl. 204-16.000.

Hasegawa, Akira: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,528,330, Cl. 525-85.000.

Hasegawa, Kyusei: *See*—
Ito, Hiroshi; Hasegawa, Kyusei; Takeuchi, Takashi; and Ikenaga, Takayuki, 4,528,105, Cl. 252-8.55D.

Hasegawa, Shumpei; and Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling fuel supply to an internal

combustion engine after termination of fuel cut. 4,527,521, Cl. 123-326.000.
Haselwarter, Klaus: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, 4,528,174, Cl. 423-488.000.
Hashimoto, Akira: *See*—
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.
Hashimoto, Fukuo: *See*—
Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, 4,528,074, Cl. 204-16.000.
Hass, Robert H.; and Ward, John W., to Union Oil Company of California. Catalyst for oxidizing hydrogen sulfide. 4,528,277, Cl. 502-79.000.
Hastings, Ray D.; and Boyer, Ernest W., to Conoco Inc. Event detection apparatus. 4,528,553, Cl. 340-526.000.
Hatta, Koichi; and Komeda, Kenichiro, to Sharp Kabushiki Kaisha. Shopping calculator with comparison feature. 4,528,638, Cl. 364-709.000.
Hattemer, James C., to Graphic Resources, Inc. Method of manufacturing an elongated label supply. 4,528,055, Cl. 156-247.000.
Hattori, Shinichiro, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,527,552, Cl. 128-6.000.
Hauptmann, Rudolf, to Siemens Aktiengesellschaft. Pulse doppler radar receiver with a circuit for reducing spurious signals. 4,528,565, Cl. 343-17.10R.
Hauschildt, Klaus-Robert: *See*—
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,528,358, Cl. 528-94.000.
Hauser, Peter: *See*—
Goede, Simon; Hauser, Peter; and Mira, Silvio, 4,527,894, Cl. 356-28.000.
Hauser, William P., to Du Pont de Nemours, E. I., and Company. Prelamination, imagewise exposure of photohardenable layer in process for sensitizing, registering and exposing circuit boards. 4,528,261, Cl. 430-322.000.
Hausermann, Max, to Philip Morris Incorporated. Filter cigarette. 4,527,573, Cl. 131-336.000.
Havranek, Zdenek: *See*—
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.
Hayakawa, Hiroshi: *See*—
Kita, Toshio; Ikeda, Nobumasa; Takusagawa, Takashi; Goto, Yoshiharu; Hayakawa, Hiroshi; and Togashi, Minoru, 4,527,606, Cl. 152-209.00R.
Hayakawa, Shohei: *See*—
Ozone, Takashi; Hayakawa, Shohei; Nakajima, Fusao; Yamada, Keiichi; and Araki, Kazuo, 4,527,356, Cl. 51-101.00R.
Hayashi, Kiyoshi: *See*—
Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, 4,528,491, Cl. 318-603.000.
Hayashi, Masahiro: *See*—
Aoyama, Fumihiko; Murata, Kazushige; and Hayashi, Masahiro, 4,528,152, Cl. 264-87.000.
Hayashi, Masayuki; and Suzuki, Masatoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Washing device in a container sealing apparatus. 4,527,377, Cl. 53-167.000.
Hayashi, Osamu; Kurihara, Hideo; and Matsumoto, Yukio, to UBE Industries, Ltd. Process for producing hydrophilic polymers. 4,528,340, Cl. 525-379.000.
Hayes, Arthur R. Paint can holder or the like. 4,527,720, Cl. 224-148.000.
Hayes, Harry: *See*—
Morton, Anthony J.; Harvey, Kenneth; and Hayes, Harry, 4,528,181, Cl. 424-52.000.
Hayes, Michael H.; and Pearson, Ernest J., to Chloride Group Public Limited Company. Grids for electric storage batteries. 4,528,255, Cl. 429-233.000.
Haynes, Charles A.: *See*—
Seal, Douglas T.; and Haynes, Charles A., 4,528,441, Cl. 219-532.000.
Hazan, Jean-Pierre: *See*—
Steers, Michel; Hazan, Jean-Pierre; and Courdille, Michel, 4,528,558, Cl. 340-686.000.
Heath Company: *See*—
Krenz, Horst M., 4,527,766, Cl. 248-371.000.
Heath, Harry G., Jr. Tamper evident container closure. 4,527,702, Cl. 215-225.000.
Hedberg, Borje J. Device for web removal from a cylinder. 4,528,067, Cl. 162-281.000.
Heesom, Neil C.: *See*—
Buckle, Brian L.; and Heesom, Neil C., 4,527,582, Cl. 137-81.200.
Hehl, Edward M.: *See*—
Swartzbaugh, Peter T.; and Hehl, Edward M., 4,527,706, Cl. 215-252.000.
Heiart. Robert B.; and Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Automatic repetitive registration and imagewise exposure of sheet substrates. 4,527,890, Cl. 355-100.000.
Heiba, El-Ahmadi I. Herbicidal N-substituted-5(substituted-phenoxy)-2-substituted benzoic acid sulfamidoyl fluoride. 4,528,145, Cl. 260-543.00F.
Heidemann, Gunter: *See*—
Ghyczy, Miklos; Erdos, Adorjan; Heidemann, Gunter; and Ritzmann, Gotz, 4,528,193, Cl. 514-78.000.
Heifner, Ralph D.: *See*—
Roth, David J.; Culler, Lawrence R.; and Heifner, Ralph D., 4,527,779, Cl. 266-227.000.
Heimeri, Wilfried C., to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Device for the production of glass drops from a glass melt containing radioactive waste. 4,528,014, Cl. 65-142.000.
Heinze, Frank; and Richter, Heinz, to Messerschmitt-Boelkow-Blohm Gesellschaft mbH. Fiber reinforced component and method for strengthening such components. 4,528,051, Cl. 156-92.000.
Heise, Rolf: *See*—
Bottcher, Rolf; Heise, Rolf; and Praxator, Helmut, 4,527,793, Cl. 271-263.000.
Heitman, Christopher J.; and Schwehr, Gregory D., to General Electric Company. Self-aligning control mechanism. 4,527,440, Cl. 74-10.00R.
Hektoen, Per: *See*—
Stahl, Torbjorn; Hektoen, Per; and Karlsen, Oystein, 4,528,054, Cl. 156-226.000.
Heller, Sherman L., to Albert Einstein College of Medicine of Yeshiva University. Dual collimator. 4,528,453, Cl. 250-505.100.
Helms, Clifford: *See*—
Smithbauer, Donald J.; Lytle, Daniel R.; and Helms, Clifford, 4,527,470, Cl. 101-111.000.
Helwig Carbon, Inc.: *See*—
Braun, Kenneth E., 4,528,557, Cl. 340-648.000.
Hench, Hans: *See*—
Lettner, Horst H.; Hunke, Friedrich; and Hench, Hans, 4,528,157, Cl. 264-237.000.
Hendrickson, Larry L.: *See*—
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,528,020, Cl. 71-28.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Bragulla, Siegfried, 4,528,110, Cl. 252-106.000.
Bruns, Klaus; and Dang, Thuy N., 4,528,126, Cl. 252-522.00R.
Friese, Hans-Herbert; and Prinz, Wolfgang, 4,527,992, Cl. 8-94.210.
Wichelhaus, Winfried; and Schroder, Christine, 4,528,149, Cl. 264-13.000.
Henkel Kommanditgesellschaft (KGaA): *See*—
Moller, Hinrich; and Wallat, Siegfried, 4,528,286, Cl. 514-232.000.
Henniger, Peter W.; van der Drift, Johannes K.; Kapur, Jagdish C.; and Fasel, Herman P., to Gist-Brocades N.V. Process for the preparation of penicillanic acid 1,1-dioxides. 4,528,135, Cl. 260-245.20R.
Henry, Peter, to VDO Adolf Schindling AG. Circuit for storing a multi-digit decimal numerical value of the distance traversed by a vehicle. 4,528,683, Cl. 377-24.000.
Henry, Rebecca D., to Ciba-Geigy Corporation. Epoxy resin modeling stock. 4,528,305, Cl. 523-219.000.
Henschke, Robert W.: *See*—
Wayne, Robert J.; Henschke, Robert W.; and Mongeon, Robert J., 4,528,663, Cl. 372-26.000.
Heraeus Quarzschmelze GmbH: *See*—
Albrecht, Horst, 4,528,163, Cl. 422-249.000.
Hercules Incorporated: *See*—
Gill, Dee R.; and Marks, Rex B., 4,528,060, Cl. 156-432.000.
Hermann Rappold & Co. GbmH: *See*—
Muller, Rudolf; and Stolberg, Hermann J., 4,527,773, Cl. 251-306.000.
Hermanns, Hans-Josef: *See*—
Miller, Gert; Diers, Franz; and Hermanns, Hans-Josef, 4,527,577, Cl. 133-3.00H.
Herrington, F. John: *See*—
Grosz, Edward G.; and Herrington, F. John, 4,527,751, Cl. 242-75.510.
Herron, William L.; and Speckman, John D., to Singer Company, The. Bobbin case position plate adjustment mechanism. 4,527,494, Cl. 112-231.000.
Hertel, Richard J., to International Telephone and Telegraph Corporation. Zoom focus and deflection assembly for electron discharge devices of the camera tube type. 4,527,846, Cl. 315-382.000.
Heslin, K. B. Intraocular lens construction. 4,527,294, Cl. 623-6.000.
Hester, Lawrence R., II, to Halliburton Company. Steam generator cleaning apparatus control system. 4,527,515, Cl. 122-392.000.
Heun, Reinhard: *See*—
Ilgner, Hartmut; Kledewski, Peter; and Heun, Reinhard, 4,528,147, Cl. 261-128.000.
Heups, Gert, to Albert Nestler GmbH. Holding and guiding device for traveling-carriage drafting machines. 4,527,340, Cl. 33-430.000.
Hewlett-Packard Company: *See*—
Boyden, James H., 4,528,574, Cl. 346-140.00R.
Cloutier, Frank L.; Low, Robert N.; McClelland, Paul H.; and Nielsen, Niels J., 4,528,577, Cl. 346-140.00R.
Huijer, Ernst, 4,528,529, Cl. 333-219.000.
Hewlett-Packard GmbH: *See*—
Traub, Stefan, 4,528,499, Cl. 324-62.000.
Heye, Hermann: *See*—
Schneider, Wilhelm; and Seidel, Hans-Georg, 4,528,018, Cl. 65-260.000.
Heymann, Mark S.; and Bachenheimer, Steven. Devices for securing a debris holding tray to a glass or dish rack. 4,527,707, Cl. 220-1.00R.
Heyse, Klaus: *See*—
Hutschenreuter, Elfriede; Andrae, Klaus; and Heyse, Klaus, 4,528,225, Cl. 428-36.000.

Hicks, Gregory F.: *See*—
Mein, Gordon F.; Terry, John B.; and Hicks, Gregory F., 4,528,676, Cl. 375-14.000.
Hieber, Heinz H.: *See*—
Wolf, Peter H.; Clarke, David C.; and Hieber, Heinz H., 4,527,469, Cl. 101-93.040.
Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Chuck for machine tools. 4,527,808, Cl. 279-1.00J.
Higashinakagawa, Emiko; Sato, Kanemitsu; Inaba, Michihiko; Ohtake, Yasuhisa; Kantou, Masaharu; and Itoh, Masayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Shadow mask. 4,528,246, Cl. 428-596.000.
Hiiragi, Mineharu: *See*—
Kigasawa, Kazuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, 4,528,372, Cl. 544-310.000.
Hijikigawa, Masaya: *See*—
Miyoshi, Shuji; Sugihara, Takashi; and Hijikigawa, Masaya, 4,528,543, Cl. 338-35.000.
Hill, James D., Jr.: *See*—
Long, Delmar D.; and Hill, James D., Jr., 4,528,214, Cl. 427-173.000.
Hill, Thomas C., III, to Tektronix, Inc. Differential amplifier with dynamic thermal balancing. 4,528,516, Cl. 330-254.000.
Hilton-Davis Chemical Co., The: *See*—
Schmidt, Paul J.; and Jefferies, Patrick J., 4,528,136, Cl. 260-391.000.
Hinden, Jean M.: *See*—
Beer, Henri B.; and Hinden, Jean M., 4,528,084, Cl. 204-290.00F.
Hino Jidosha Kogyo Kabushiki Kaisha: *See*—
Sato, Akihiko; and Watanabe, Akira, 4,527,392, Cl. 60-313.000.
Hiraguri, Seisuke, to Victor Company of Japan, Ltd. Rotary magnetic head scanning control system in a magnetic recording and reproducing apparatus. 4,528,605, Cl. 360-77.000.
Hirano, Takashi, to Yamato Scale Company, Limited. Combination weighing machine. 4,527,646, Cl. 177-25.000.
Hiraoka, Yasuo: *See*—
Kasai, Yoshiaki; Hiraoka, Yasuo; Yuasa, Masaharu; Harada, Masataka; and Saito, Masao, 4,527,532, Cl. 123-520.000.
Hirata, Mituo: *See*—
Nishihata, Kouji; Nakazima, Ichiro; and Hirata, Mituo, 4,527,698, Cl. 212-187.000.
Hiratani, Hajime: *See*—
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Hirayama, Kazuhiro: *See*—
Inoue, Takahiro; Hirayama, Kazuhiro; and Tsukada, Masaharu, 4,528,580, Cl. 346-160.000.
Hiromasa, Shunichiro: *See*—
Abe, Tomoaki; Kinugawa, Masumi; and Hiromasa, Shunichiro, 4,527,530, Cl. 123-494.000.
Hironaka, Toshio: *See*—
Sakamoto, Teruhisa; Ishida, Satoshi; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,528,410, Cl. 568-897.000.
Hiross International Corp., S.A.: *See*—
Miller, Allan S., 4,527,584, Cl. 137-192.000.
Hirschfeld, Tomas B., to United States of America, Energy. Nonsaturable microdryer. 4,528,078, Cl. 204-129.000.
Hirschmanner, Franz; and Rom, Ernst, to Voest-Alpine Aktiengesellschaft. Coiler-furnace unit. 4,528,434, Cl. 219-10.49A.
Hirvonen, James K.; Wittkower, Andrew B.; and Denholm, A. Stuart, to Zymet, Inc. Method and apparatus for controlling article temperature during treatment in vacuum. 4,528,208, Cl. 427-35.000.
Hitachi Chemical Co., Ltd.: *See*—
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.
Hitachi Koki Company, Limited: *See*—
Inaniwa, Masahiro; and Ogawa, Yoichi, 4,528,492, Cl. 320-36.000.
Hitachi, Ltd.: *See*—
Ichikawa, Akira; Komatsu, Akio; and Asakawa, Yoshiaki, 4,528,688, Cl. 381-43.000.
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
Jimbo, Yoshiji; and Kotake, Kazuyoshi, 4,528,487, Cl. 318-338.000.
Kohno, Michinaga; Sugimoto, Koichi; and Nakagawa, Yasuo, 4,527,326, Cl. 29-705.000.
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.
Matsushita, Yasuo; Nakamura, Kousuke; and Kosugi, Tetuo, 4,528,121, Cl. 252-516.000.
Nakahata, Kozo; Kawaguchi, Ikuo; and Yamaguchi, Kazuo, 4,528,634, Cl. 364-491.000.
Nishihata, Kouji; Nakazima, Ichiro; and Hirata, Mituo, 4,527,698, Cl. 212-187.000.
Osawa, Michitaka, 4,528,520, Cl. 330-300.000.
Sasaki, Akira; Mashiko, Kazuyuki; Saitoh, Shouji; and Hakoyama, Akiyoshi, 4,528,572, Cl. 346-76.0PH.
Sato, Kanemasa; Ueno, Sadayasu; Oyama, Yoshishige; and Nishimura, Yutaka, 4,527,423, Cl. 73-118.000.
Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; Kobori, Shigeyuki; and Nishihara, Motohisa, 4,527,428, Cl. 73-721.000.
Shirai, Yuji; Otsuka, Kanji; Usami, Tamotsu; and Yamasaki, Yasuyuki, 4,527,730, Cl. 228-179.000.
Sugita, Yutaka; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Ikeda, Tadashi, 4,528,645, Cl. 365-36.000.
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Yamaguchi, Masanori; Tsutsumi, Yasuyuki; Nogita, Shunsuke; Shimada, Kazunari; and Maruko, Saburo, 4,528,251, Cl. 429-25.000.
Hnat, Diane L.: *See*—
Wang, Martha Y.; Michnowski, Jane; Hnat, Diane L.; and Ross, Robert E., 4,528,202, Cl. 426-550.000.
Hodge, James D., to General Electric Company. Mullite-cordierite composite ceramic and method for preparation. 4,528,275, Cl. 501-9.000.
Hoechst Aktiengesellschaft: *See*—
Becker, Reinhold; and Sattler, Helmut, 4,527,505, Cl. 118-44.000.
Hutschenreuter, Elfriede; Andrae, Klaus; and Heyse, Klaus, 4,528,225, Cl. 428-36.000.
Lind, Erwin, 4,528,256, Cl. 430-83.000.
Rieck, Hans-Peter; and Kalz, Hans-Jurgen, 4,528,172, Cl. 423-329.000.
Rudolphy, Albert, 4,528,036, Cl. 106-30.000.
Schuster, Claus; and Homuth, Horst, 4,527,993, Cl. 8-471.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Ong, Helen H.; and Profitt, James A., 4,528,399, Cl. 568-43.000.
Strupczewski, Joseph T., 4,528,292, Cl. 514-321.000.
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,528,376, Cl. 546-198.000.
Hoenig, Richard, to BOC Group, Inc., The. Scavenger system. 4,527,558, Cl. 128-205.240.
Hoesch Werke Ag: *See*—
Walter, Horst, 4,527,454, Cl. 83-499.000.
Hoesch Werke Aktiengesellschaft: *See*—
Bartzick, Gunter; Buhne, Gerd; and Naydowski, Reinhard, 4,527,379, Cl. 53-589.000.
Hoetzl, Max, to Midland-Ross Coporation. Apparatus for cooling a strip prior to a minispangle operation. 4,527,506, Cl. 118-63.000.
Hoffelner, Volkwin: *See*—
Vogt, Peter; and Hoffelner, Volkwin, 4,527,742, Cl. 239-391.000.
Hoffman, Richard B.; and Po, Jonathan B. Radiology apron having a waist support means. 4,527,288, Cl. 2-48.000.
Hoffmann, Erwin; and Schneider, Josef, to Ford Motor Company. Manual transmission shifting mechanism. 4,527,442, Cl. 74-411.500.
Hoffmann-La Roche Inc.: *See*—
Petrzilka, Martin, 4,528,114, Cl. 252-299.600.
Hofmann, Hansdieter; Rothe, Hans-Jochen; Skupin, Georg; and Wolff, Konrad, to Davy McKee. Method for producing spinnable polyamide from dinitrile with phosphorus ester catalyst. 4,528,362, Cl. 528-336.000.
Hogan, Thomas C.: *See*—
Bahr, Richard G.; and Hogan, Thomas C., 4,528,661, Cl. 370-86.000.
Hohman, Charles M.: *See*—
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,528,013, Cl. 65-136.000.
Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itoh, Yasuo; Kato, Hideo; Ogawa, Nobuo; Koshinaka, Eiichi; Suzuki, Tomio; and Yagi, Noriyuki, 4,528,287, Cl. 514-254.000.
Holderegger, Rolf; and Jilek, Josef H., to Dow Chemical Company, The. Composition for coating a substrate with an epoxy resin powder coating and a method of making matt finishes with the composition. 4,528,127, Cl. 525-530.000.
Hollander, Edward F., Jr., to Glass, John P. Package. 4,527,687, Cl. 206-219.000.
Hollweck, Walter; Marz, Kurt; and Eschenbacher, Herbert, to Inter Control Hermann Kohler Elektrik GmbH & Co. Bimetal controlled snap disc thermal switch. 4,528,541, Cl. 337-354.000.
Holste, James C.: *See*—
Hall, Kenneth R.; and Holste, James C., 4,527,435, Cl. 73-863.030.
Homuth, Horst: *See*—
Schuster, Claus; and Homuth, Horst, 4,527,993, Cl. 8-471.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujitaka, Nobuo; Fujisaki, Masaru; and Hagiwara, Yoshitoshi, 4,527,839. Cl. 301-63.0DD.
Hasegawa, Shumpei; and Kishi, Noriyuki, 4,527,521, Cl. 123-326.000.
Irino, Hiroshi; and Aoi, Tomio, 4,527,527, Cl. 123-438.000.
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Osaki, Kiyoshi; and Koinuma, Yutaka, 4,527,518, Cl. 123-90.230.
Ozone, Takashi; Hayakawa, Shohei; Nakajima, Fusao; Yamada, Keiichi; and Araki, Kazuo, 4,527,356, Cl. 51-101.00R.
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, 4,527,507, Cl. 118-314.000.
Honeywell Inc.: *See*—
Arcara, Samuel A., 4,527,418, Cl. 73-30.000.
Dunaway, Thomas J.; Spielberger, Richard K.; and Wittenberger, John C., 4,528,446, Cl. 250-216.000.
Gordon, William R.; and Nicholson, Peter N., 4,528,449, Cl. 250-352.000.
Honig, Gunter; Kaiser, Gunther; Lotterbach, Gerhard; and Zucker, Udo, to Robert Bosch GmbH. Apparatus for determining the value of a cyclically varying parameter of an internal combustion engine. 4,527,422, Cl. 73-117.300.
Hoogovens Groep B.V.: *See*—
Ouwerk ;k, Johannes H. W., 4,527,409, Cl. 72-202.000.
Hoover Company, The: *See*—
Maurer, Edgar A.; and Essex, John D., 4,527,302, Cl. 15-325.000.
Hoppe, Hans: *See*—
Krambrock, Wolfgang; and Hoppe, Hans, 4,528,092, Cl. 209-139.00R.

Horeschi, Giancarlo: *See*—
Barozzi, Gian P.; and Horeschi, Giancarlo, 4,527,922, Cl. 400-637.500.
Hori, Renji. Automatic lopping machine. 4,527,603, Cl. 144-2.00Z.
Horlamus, Herbert: *See*—
Nied, Roland; Horlamus, Herbert; and Kaiser, Fritz, 4,528,091, Cl. 209-139.00R.
Horner, Michael S.; Brisken, Axel F.; and Zanelli, Claudio I., to General Electric Company. Ultrasonic transducer and attenuating material for use therein. 4,528,652, Cl. 367-162.000.
Horner, Reginald M.: *See*—
Baird, Richard H.; Blechar, Theodore J.; Giladett, Leo V. B.; Horner, Reginald M.; Prouty, Gerald G.; and Rinde, David L., 4,527,623, Cl. 165-173.000.
Hornle, Reinhold: *See*—
Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, 4,527,746, Cl. 241-23.000.
Horton, L. Brent: *See*—
Horton, M. Duane; and Horton, L. Brent, 4,527,643, Cl. 175-329.000.
Horton, M. Duane; and Horton, L. Brent, to Megcadiamond Industries Inc. Rotary cutting member for drilling holes. 4,527,643, Cl. 175-329.000.
Hosiery Maufacturing Corp. of Morganton: *See*—
Fullbright, Olen E.; Baird, Truette H.; and Wade, Jack H., 4,527,403, Cl. 66-177.000.
Hosoe, Kazuya; and Kinoshita, Takao, to Canon Kabushiki Kaisha. Camera system. 4,527,879, Cl. 354-400.000.
House, Roy F.; and Scearce, Forrest A., to NL Industries, Inc. Oil based packer fluids. 4,528,104, Cl. 252-8.50M.
Howden, Ashley G.: *See*—
Jones, Lawrence T.; Lee, R. Stephen; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,527,688, Cl. 206-315.100.
Howlett, Donald L.; Meyer, Herbert J.; and Zimmer, Stanley F., to Texaco Inc. Streamer cable multiplexing apparatus. 4,528,650, Cl. 367-79.000.
Hoya Lens Corporation: *See*—
Tarumi, Niro; Okubo, Yoichi; and Yoshimoto, Seiichi, 4,528,351, Cl. 526-314.000.
Hoyt, Franklin S.: *See*—
Fyfe, Donald W.; and Hoyt, Franklin S., 4,527,618, Cl. 165-18.000.
Hoyt, Robert. Flashlight. 4,528,621, Cl. 362-189.000.
Hrdina, Jan: *See*—
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.
Hrivnak, Emil E.: *See*—
Fisher, Harry W.; and Hrivnak, Emil E., 4,527,600, Cl. 141-4.000.
Hsu, Chao-Yang, to Sun Tech, Inc. Catalyst for hydroformylation of olefins. 4,528,278, Cl. 502-153.000.
Hsu, Wen C. Workbench. 4,527,786, Cl. 269-154.000.
Huang, Hsin: *See*—
Knowlton, Ruth H.; and Huang, Hsin, 4,527,642, Cl. 175-329.000.
Huber, Jakob; Pettenpaul, Ewald; and Petz, Felix, to Siemens Aktiengeselischaft. Chain amplifier. 4,528,518, Cl. 330-277.000.
Huebner, Willi E.; and Niemerg, Joseph P., to International Business Machines Corporation. Coil for disk file actuator. 4,528,467, Cl. 310-13.000.
Huffaker, Roger W.: *See*—
Rickey, Wynn P.; Dobson, Deborah H.; and Huffaker, Roger W., 4,528,041, Cl. 134-8.000.
Huffman, Walter K.: *See*—
Flick, Robert H.; and Huffman, Walter K., 4,528,531, Cl. 335-23.000.
Huggins, Alan R.: *See*—
Sandine, William E.; and Huggins, Alan R., 4,528,269, Cl. 435-34.000.
Hughes Aircraft Company: *See*—
Hansen, Siegfried, 4,528,490, Cl. 318-560.000.
Lee, William W. Y., 4,528,581, Cl. 357-23.110.
Hughes, Donald W. K.; Metzger, Donald L.; and Reynolds, Charles E., to AMP Incorporated. Terminal for connecting a wire to a blade type terminal. 4,527,857, Cl. 339-258.00S.
Huijer, Ernst, to Hewlett-Packard Company. Magnetostatic wave resonator. 4,528,529, Cl. 333-219.000.
Hunke, Friedrich: *See*—
Lettner, Horst H.; Hunke, Friedrich; and Hench, Hans, 4,528,157, Cl. 264-237.000.
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, to Elektroschmelzwerk Kempten GmbH. Refractory, electrically conductive, mixed materials containing boron nitride and process for their manufacture. 4,528,120, Cl. 252-516.000.
Hunt, Stuart B. D.; Chandler, Philip B.; and Harrison, Thomas L., to Avery International Corp. Curl free reinforced paper sheet technique. 4,528,056, Cl. 156-253.000.
Huszarik, Fred A.: *See*—
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., 4,528,150, Cl. 264-36.000.
Charlebois, Leonard J.; D'Aoust, Ronald R.; and Huszarik, Fred A., 4,528,419, Cl. 174-88.00R.
Hutchison, Stanley O.: *See*—
Dickinson, Ben W. O., III; Dickinson, Robert W.; and Hutchison, Stanley O., 4,527,639, Cl. 175-61.000.
Hutschenreuter, Elfriede; Andrae, Klaus; and Heyse, Klaus, to Hoechst Aktiengesellschaft. Easily peelable sausage casing having a glued seam, process for its manufacture, and its use. 4,528,225, Cl. 428-36.000.
Hutson, Thomas, Jr. Diesel fuel and gasoline production. 4,528,411, Cl. 585-329.000.
Hvezda, Jaroslav M.: *See*—
Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., 4,527,848, Cl. 339-17.00M.
Hwo, Charles C., to Shell Oil Company. Plastic bags for medical solutions and blood. 4,528,220, Cl. 428-35.000.
Hydroc Gesteinsbohrtechnik GmbH: *See*—
Klemm, Gunter, 4,527,641, Cl. 175-92.000.
Hydroperfect International Hpi: *See*—
Laumont, Roger, 4,527,966, Cl. 418-132.000.
Hydrowatt Systems Limited: *See*—
Frey, Bernhard, 4,527,464, Cl. 92-86.500.
Hylsa, S.A.: *See*—
Martinez Vera, Enrique R.; and Becerra-Novoa, Jorge O., 4,528,030, Cl. 75-35.000.
Hynes, Frederick B. W. Blasting cap to primer adapter. 4,527,482, Cl. 102-331.000.
Hyttinen, Seppo J. Method for building a protective wall when constructing an underwater base. 4,527,926, Cl. 405-14.000.
I. D. Engineering, Inc.: *See*—
Vandebult, Jan, 4,527,310, Cl. 24-150.00R.
Ibrahim, Abd-El-Fattah A.: *See*—
Kadekodi, Narayan K.; Shey-Ping, Larry S.; and Ibrahim, Abd-El-Fattah A., 4,528,594, Cl. 358-213.000.
Ichikawa, Akira; Komatsu, Akio; and Asakawa, Yoshiaki, to Hitachi, Ltd. Continuous speech recognition method. 4,528,688, Cl. 381-43.000.
Ichikawa, Keiko: *See*—
Kigasawa, Kazuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, 4,528,372, Cl. 544-310.000.
ICI Americas Inc.: *See*—
Evans, John H.; and Sabotta, Kenneth T., 4,527,481, Cl. 102-204.000.
Lee, John T. M., 4,527,634, Cl. 169-13.000.
IFM-Akustikbyran AB: *See*—
Hagbjer, Gunnar, 4,527,371, Cl. 52-309.160.
Iida, Takafumi: *See*—
Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, 4,528,184, Cl. 424-79.000.
Iida, Tetsuya; and Sakaue, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Charge-coupled device output circuit. 4,528,684, Cl. 377-60.000.
Ikariishi, Koichi; Kitano, Toshiaki; Shinohara, Masanori; and Shimoji, Yasuo, to Kawasaki Steel Corporation; and Koyo Seiko Company Limited. Sealed multi-row roller bearing device for rolling mills. 4,527,915, Cl. 384-480.000.
Ikawa, Kazuo: *See*—
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,527,654, Cl. 180-140.000.
Ikeda, Akihiko: *See*—
Ai, Hideo; Ikeda, Akihiko; and Matsuoka, Yoshio, 4,528,332, Cl. 525-332.200.
Ikeda, Nobumasa: *See*—
Kita, Toshio; Ikeda, Nobumasa; Takusagawa, Takashi; Goto, Yoshiharu; Hayakawa, Hiroshi; and Togashi, Minoru, 4,527,606, Cl. 152-209.00R.
Ikeda, Tadashi: *See*—
Sugita, Yutaka; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Ikeda, Tadashi, 4,528,645, Cl. 365-36.000.
Ikenaga, Takayuki: *See*—
Ito, Hiroshi; Hasegawa, Kyusei; Takeuchi, Takashi; and Ikenaga, Takayuki, 4,528,105, Cl. 252-8.55D.
Ilgner, Hartmut; Kledewski, Peter; and Heun, Reinhard, to Uhde GmbH. Process for humidifying a gas stream, particularly in methanol and/or ammonia plants. 4,528,147, Cl. 261-128.000.
Illinois Tool Works Inc.: *See*—
Ruehl, William E.; and DeMarco, Joseph P., 4,527,312, Cl. 24-453.000.
Illinois Water Treatment Company: *See*—
Burke, Dennis J.; and Moore, Robert D., 4,528,101, Cl. 210-656.000.
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, to Mitsubishi Chemical Industries Limited; and Hitachi Limited. Anthraquinone dye and liquid crystal composition containing the dye. 4,528,113, Cl. 252-299.100.
Imperial Chemical Industries PLC: *See*—
Alford, Neil M., 4,528,238, Cl. 428-246.000.
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,528,171, Cl. 423-277.000.
Preston, John; and Carling, William R., 4,528,282, Cl. 514-19.000.
Imura, Takayoshi: *See*—
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.
Inaba, Michihiko: *See*—
Higashinakagawa, Emiko; Sato, Kanemitsu; Inaba, Michihiko; Ohtake, Yasuhisa; Kantou, Masaharu; and Itoh, Masayuki, 4,528,246, Cl. 428-596.000.
Inagaki, Mitsuo: *See*—
Mitsui, Takao; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,527,964, Cl. 418-55.000.

Inagaki, Nobuo: *See*—
Edahiro, Takao; Inagaki, Nobuo; and Kurosaki, Shiro, 4,528,010, Cl. 65-18.100.
Inamori, Kazuo; and Gotoda, Katsuhiko, to Kyoto Ceramic Co., Ltd. Electrophotographic recording apparatus having both functions of copying and printing. 4,527,886, Cl. 355-3.00R.
Inanaga, Takugi: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,527,756, Cl. 242-68.300.
Inaniwa, Masahiro; and Ogawa, Yoichi, to Hitachi Koki Company, Limited. Battery charger. 4,528,492, Cl. 320-36.000.
Inax Corporation: *See*—
Aoyama, Fumihiko; Murata, Kazushige; and Hayashi, Masahiro, 4,528,152, Cl. 264-87.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Balbo, Edoardo, 4,528,578, Cl. 346-140.00R.
Brescia, Riccardo, 4,528,579, Cl. 346-140.00R.
Ingalls, Robert A., to Dunham-Bush, Inc. Screw rotor machine with specific tooth profile. 4,527,967, Cl. 418-150.000.
Ingersoll-Rand Company: *See*—
Markley, George L., 4,527,965, Cl. 418-88.000.
Ingram, James L., to Car Fresh Manufacturing Company, Inc. Coin operated fragrance dispenser. 4,527,713, Cl. 222-2.000.
Inland Steel Company: *See*—
DuBroff, William; Kaegi, Dennis D.; Knoerzer, Jerome J.; and Spearin, Elliott Y., 4,528,069, Cl. 201-20.000.
Inoue, Akihisa: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Hagiwara, Michiaki; and Yasuhara, Kiyomi, 4,527,614, Cl. 164-463.000.
Inoue, Hiroshi; Sezume, Tadashi; Isoi, Masaaki; Iwanami, Kunio; and Sei, Kazuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Production of polyolefin copolymer. 4,528,329, Cl. 525-74.000.
Inoue-Japax Research Inc.: *See*—
Inoue, Kiyoshi, 4,527,729, Cl. 228-162.000.
Inoue, Kiyoshi, to Inoue-Japax Research Inc. Die forming method. 4,527,729, Cl. 228-162.000.
Inoue, Nobuhiro: *See*—
Fushiya, Fusao; Inoue, Nobuhiro; and Saito, Setsuo, 4,527,380, Cl. 56-12.800.
Inoue, Takahiro; Hirayama, Kazuhiro; and Tsukada, Masaharu, to Canon Kabushiki Kaisha. Image information recording apparatus. 4,528,580, Cl. 346-160.000.
Inteleplex Corporation, The: *See*—
Cupani, Carmine, 4,528,422, Cl. 179-2.00A.
Inter Control Hermann Kohler Elektrik GmbH & Co.: *See*—
Hollweck, Walter; Marz, Kurt; and Eschenbacher, Herbert, 4,528,541, Cl. 337-354.000.
Intermark Industries, Inc.: *See*—
Robinson, Irwin J., III, 4,528,636, Cl. 364-521.000.
International Acoustics Incorporated: *See*—
Katz, Hart V., 4,528,689, Cl. 381-67.000.
International Business Machines Corporation: *See*—
Beyer, Klaus D.; and Silvestri, Victor J., 4,528,047, Cl. 148-175.000.
Cairns, James A.; and Ziegler, James F., 4,528,212, Cl. 427-96.000.
Coleman, Edwin T., III, 4,528,431, Cl. 200-67.00A.
Dean, Mark E.; and Moeller, Dennis L., 4,528,626, Cl. 364-200.000.
Geipel, Henry J., Jr.; Schaefer, Charles A.; White, Francis R.; and Wursthorn, John M., 4,527,325, Cl. 29-571.000.
Huebner, Willi E.; and Niemerg, Joseph P., 4,528,467, Cl. 310-13.000.
Jones, Gardner D., Jr., 4,528,659, Cl. 370-80.000.
Kamionka, Harvey E.; Pence, Jerry W.; and Tran, Dat M., 4,528,624, Cl. 364-200.000.
Ketchen, Mark B., 4,528,530, Cl. 333-246.000.
Mako, John, 4,527,920, Cl. 400-146.000.
Merkling, Robert M., Jr.; and Stanasolovich, David, 4,528,066, Cl. 156-643.000.
Pearson, Kenneth A.; and Zimmerman, Luther L., 4,528,693, Cl. 382-47.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,528,142, Cl. 260-463.000.
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,528,402, Cl. 568-445.000.
International Minerals & Chemical Corp.: *See*—
Medbery, John L., 4,528,021, Cl. 71-41.000.
International Paper Company: *See*—
Smith, Wesley H., 4,527,732, Cl. 229-17.00G.
International Standard Electric Corporation: *See*—
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,528,562, Cl. 340-805.000.
International Telephone and Telegraph Corporation: *See*—
Agrawal, Bhagwati; and Shenoi, Kishan, 4,528,551, Cl. 340-347.0DA.
Hertel, Richard J., 4,527,846, Cl. 315-382.000.
Kebede, Berhanu; and George, Marion L., 4,527,772, Cl. 251-138.000.
Middleton, Francisco A.; Das, Santanu; and Hargrave, Franklin, 4,528,424, Cl. 179-17.00A.
InTest Corporation: *See*—
Smith, Nathan R., 4,527,942, Cl. 414-590.000.
Iolab Corporation: *See*—
Beard, Charles D.; Yamada, Akira; and Doddi, Namassivaya, 4,528,311, Cl. 524-91.000.
Ionics, Incorporated: *See*—
Seamans, Thomas F., 4,528,173, Cl. 423-421.000.
Irani, Keikhosrow; and MacBurney, Michael G., to Mikron Instrument Company, Inc. Infrared transducer-transmitter for non-contact temperature measurement. 4,527,896, Cl. 356-43.000.
Irie, Namio: *See*—
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,527,654, Cl. 180-140.000.
Irino, Hiroshi; and Aoi, Tomio, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling opening angle of throttle valve on complete firing. 4,527,527, Cl. 123-438.000.
Ise, Masahiro; Tanaka, Hidehiko; and Machino, Katsuyuki, to Sharp Kabushiki Kaisha. Data transmission system. 4,528,677, Cl. 375-36.000.
Ishida, Satoshi: *See*—
Sakamoto, Teruhisa; Ishida, Satoshi; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,528,410, Cl. 568-897.000.
Ishiguro, Mamoru; and Enomoto, Mitsutaka, to Sony Corporation. Editing control system. 4,528,600, Cl. 360-14.100.
Ishiguro, Shoji; Mifune, Hiroyuki; Fuseya, Yoshiharu; and Kojima, Tetsuro, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,528,264, Cl. 430-609.000.
Ishihara, Naoki. Hand held hot air dryer with retractable cord. 4,528,440, Cl. 219-370.000.
Ishihara, Tomoo: *See*—
Hamada, Tooru; Tanaka, Hirohisa; and Ishihara, Tomoo, 4,527,679, Cl. 192-3.580.
Ishii, Fumiaki, to Olympus Optical Co., Ltd. Connector device for checking leakage in an airtight endoscope. 4,527,551, Cl. 128-4.000.
Ishii, Kenji: *See*—
Yasukawa, Makoto; and Ishii, Kenji, 4,528,555, Cl. 340-630.000.
Ishii, Mitsuo: *See*—
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.
Ishii, Tsuneji: *See*—
Asawa, Tatsuro; Ishii, Tsuneji; and Gunjima, Tomoki, 4,528,058, Cl. 156-306.600.
Ishii, Yutaka; Minezaki, Shigehiro; Kozaki, Shuichi; and Funada, Fumiaki, to Sharp Kabushiki Kaisha. Liquid crystal composition and liquid crystal display device. 4,528,115, Cl. 252-299.630.
Ishikawa, Paul J.: *See*—
Jones, Lawrence T.; Lee, R. Stephen; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,527,688, Cl. 206-315.100.
Ishikawa, Ryoichi: *See*—
Sugie, Toshinori; Ishikawa, Ryoichi; and Kobata, Fumihiro, 4,528,346, Cl. 525-523.000.
Ishikura, Tomoyuki: *See*—
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,528,397, Cl. 514-400.000.
Ishiwata, Yoshiro: *See*—
Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, 4,528,184, Cl. 424-79.000.
Ishizuka, Hiroshi. Apparatus for production of refractory metal from a chloride thereof. 4,527,778, Cl. 266-171.000.
Isida, Tosio: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,528,004, Cl. 55-158.000.
Isoi, Masaaki: *See*—
Inoue, Hiroshi; Sezume, Tadashi; Isoi, Masaaki; Iwanami, Kunio; and Sei, Kazuo, 4,528,329, Cl. 525-74.000.
Isolation Systems Limited: *See*—
Arato, Gabor P., 4,528,497, Cl. 324-51.000.
Israel, John W., to Italtel-Societa Italiana Telecomunicazioni S.p.A. Telecommunication system with a multiplicity of modular units interchanging digital messages. 4,528,658, Cl. 370-58.000.
ITALCEMENTI Fabbriche Riunite Cemento S.p.A.: *See*—
Catani, Paolo, 4,527,748, Cl. 241-57.000.
Italtel-Societa Italiana Telecomunicazioni S.p.A.: *See*—
Israel, John W., 4,528,658, Cl. 370-58.000.
Ito, Hiroshi; Hasegawa, Kyusei; Takeuchi, Takashi; and Ikenaga, Takayuki, to Teikoku Oil Co., Ltd.; and Kao Corporation. Micelle solution compositions for recovering crude oil. 4,528,105, Cl. 252-8.55D.
Ito, Kenji: *See*—
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,528,263, Cl. 430-544.000.
Ito, Shiro: *See*—
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, 4,527,507, Cl. 118-314.000.
Ito, Takao: *See*—
Ohsawa, Kenji; Ito, Takao; Ohsawa, Masayuki; and Kurata, Keiji, 4,528,064, Cl. 156-630.000.
Ito, Teruyoshi; and Abe, Shigeya, to Nippondenso Co., Ltd. Ignition system including ignition distributor integrated with ignition coil. 4,527,535, Cl. 123-617.000.
Ito, Tsugutaka: *See*—
Uno, Hitoshi; Karasawa, Tadahiko; Kon, Tatsuya; and Ito, Tsugutaka, 4,528,299, Cl. 514-428.000.
Itoh, Masayuki: *See*—
Higashinakagawa, Emiko; Sato, Kanemitsu; Inaba, Michihiko; Ohtake, Yasuhisa; Kantou, Masaharu; and Itoh, Masayuki, 4,528,246, Cl. 428-596.000.
Itoh, Yasuo; Kato, Hideo; Ogawa, Nobuo; Koshinaka, Eiichi; Suzuki, Tomio; and Yagi, Noriyuki, to Hokuriku Pharmaceutical Co., Ltd. 6-Fluoro-1, 4-dihydro-4-oxo-7-substituted piperazinylquinoline-3-car-

boxylic acids and the method for preparing the same. 4,528,287, Cl. 514-254.000.
Itow, Koichiro; and Komiyama, Kunihiko, to Kabushiki Kaisha Komatsu Seisakusho. Fuel blended with alcohol for diesel engine. 4,527,995, Cl. 44-56.000.
ITT Industries, Inc.: *See*—
Smith, Robert, 4,528,511, Cl. 329-50.000.
Iwahashi, Hiroshi: *See*—
Ochii, Kiyofumi; and Iwahashi, Hiroshi, 4,528,646, Cl. 365-203.000.
Iwanami, Kunio: *See*—
Inoue, Hiroshi; Sezume, Tadashi; Isoi, Masaaki; Iwanami, Kunio; and Sei, Kazuo, 4,528,329, Cl. 525-74.000.
Iwasa, Koji: *See*—
Sano, Yutaka; Iwasa, Koji; Kamamori, Hitoshi; Suginoya, Mitsuru; and Terada, Yumiko, 4,528,073, Cl. 204-15.000.
Iwata, Akira: *See*—
Kaneko, Hideo; Kumashiro, Hatsuyoshi; and Iwata, Akira, 4,527,616, Cl. 164-502.000.
Iwata, Takashi: *See*—
Tanaka, Harumi; and Iwata, Takashi, 4,527,876, Cl. 354-229.000.
Iwata, Yasuo: *See*—
Koizumi, Michio; Iwata, Yasuo; and Ohsawa, Seiichi, 4,527,921, Cl. 400-618.000.
J. I. Case Company: *See*—
Harrington, Daniel L., 4,527,659, Cl. 181-244.000.
McKee, Kenneth E.; Meitl, Harold G.; Thanh, Vo V.; and Bixler, Craig A., 4,527,444, Cl. 74-493.000.
Jabs, Gert: *See*—
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,528,153, Cl. 264-109.000.
Jackovich, Melvin C.: *See*—
Spencer, William; and Jackovich, Melvin C., 4,528,493, Cl. 322-99.000.
Jackson, Arthur R. Process for repairing a cutting saw. 4,527,322, Cl. 29-402.060.
Jackson, William R.: *See*—
Swallow, Roger T.; Jackson, William R.; and Pierce, Jack D., 4,527,402, Cl. 66-55.000.
Jacobs, Israel S.: *See*—
Becker, Joseph J.; Luborsky, Fred E.; Jacobs, Israel S.; and McCary, Richard O., 4,528,481, Cl. 315-248.000.
Jaggy, Hermann E. W.; Chatterjee, Shyam S.; and Gabard, Bernard L., to Dr. Willmar Schwabe GmbH & Co. Corynantheine derivates, processes for their preparation, and their use. 4,528,289, Cl. 514-285.000.
Jain, Pramod K.: *See*—
Pierce, Stanley L.; Brown, Larry T.; and Jain, Pramod K., 4,527,678, Cl. 192-3.580.
Jakubowski, William J.: *See*—
Ungchusri, Tep; and Jakubowski, William J., 4,527,806, Cl. 277-124.000.
Jalfre, Maurice F.: *See*—
Lacour, Alain P.; Langlois, Michel; Jalfre, Maurice F.; and Bucher, Bernard P., 4,528,380, Cl. 548-250.000.
Jalil, Asjed A., to Morgan Construction Company. Method and Apparatus for cooling and handling hot rolled steel rod in direct sequence with a high speed rolling operation. 4,527,408, Cl. 72-201.000.
James Hardie Industries Limited: *See*—
Musgrove, Neil R., 4,527,296, Cl. 4-324.000.
James, Rolland T.; and Chebra, Ronald J., to Base Ten Systems, Inc. Remote subscriber terminal unit. 4,528,423, Cl. 179-5.00R.
Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata; Nomoto, Reishi; and Takahashi, Masayoshi, 4,527,564, Cl. 128-339.000.
Janome Sewing Machine Industry Co., Inc.: *See*—
Takenoya, Hideaki; and Shomura, Eiichi, 4,527,495, Cl. 112-264.100.
Janssen, Edward W., to Minnesota Mining & Manufacturing Company. Anaerobically-cuting compositions. 4,528,059, Cl. 156-307.300.
Japan Chemical Research Co., Ltd.: *See*—
Nishimura, Toyohiko; Uchida, Naomi; and Hiratani, Hajime, 4,528,186, Cl. 424-99.000.
Jarvinen, Rauno: *See*—
Karhumaki, Markku; and Jarvinen, Rauno, 4,527,933, Cl. 411-463.000.
Jean, Gilbert; and Jean, Maurice. Natural organic substance for regenerating lignous vegetables. 4,528,019, Cl. 71-15.000.
Jean, Maurice: *See*—
Jean, Gilbert; and Jean, Maurice, 4,528,019, Cl. 71-15.000.
Jefferies, Patrick J.: *See*—
Schmidt, Paul J.; and Jefferies, Patrick J., 4,528,136, Cl. 260-391.000.
Jentoft, Arthur P., to Wasco Products, Inc. Skylight sealing. 4,527,368, Cl. 52-200.000.
Jezbera, Venda. Digital menstrual cycle indicator. 4,527,906, Cl. 368-107.000.
Jilek, Josef H.: *See*—
Holderegger, Rolf; and Jilek, Josef H., 4,528,127, Cl. 525-530.000.
Jimbo, Yoshiji; and Kotake, Kazuyoshi, to Hitachi, Ltd. Electric car control system. 4,528,487, Cl. 318-338.000.
Jobbins, Jill M., to Allied Corporation. Pretreatment of plastic materials for metal plating. 4,528,245, Cl. 428-457.000.
John, William W.; Pilgram, Kurt H.; and Martin, Mae E. F., to Shell Oil Company. Acylthio-substituted triazines. 4,528,027, Cl. 71-93.000.
Johnson, Charles E.: *See*—
Dean, Weibley J.; Johnson, Charles E.; and Ragard, Phillip A., 4,527,324, Cl. 29-564.600.
Johnson, D. Dale, to Ex-Cell-O Corporation. Turret drive system for armored vehicle. 4,527,458, Cl. 89-41.010.
Johnson, David W.: *See*—
Webb, Michael J.; and Johnson, David W., 4,527,856, Cl. 339-206.00R.
Johnson, Freeman K., to Johnson, Freeman K. Full dwarf hybrid sunflower seed and plant and method of producing hybrid seed. 4,527,352, Cl. 47-58.000.
Johnson, Geoffrey W. A. Composition for use with indoor tanning equipment. 4,528,183, Cl. 424-59.000.
Johnson, Glenn R.: *See*—
Liepe, Steven F.; Radochonski, Pierre; and Johnson, Glenn R., 4,528,591, Cl. 358-160.000.
Johnson, Lewis B., to University of Virginia Alumni Patents Foundation, The. Plated dental amalgam alloys. 4,528,207, Cl. 427-3.000.
Johnson, Marvin M.: *See*—
McDaniel, Max P.; and Johnson, Marvin M., 4,528,338, Cl. 526-113.000.
Johnson, Peter D.: *See*—
Anderson, John M.; and Johnson, Peter D., 4,528,209, Cl. 427-67.000.
Johnstone, Richard; and Kirkham, Edward E., to Kearney & Trecker Corporation. Adaptive control system for machine tool or the like. 4,527,661, Cl. 184-6.100.
Jones, Edwin R., Jr., to CJM Associates. Three-dimensional video apparatus and methods using composite and mixed images. 4,528,587, Cl. 358-92.000.
Jones, Gardner D., Jr., to International Business Machines Corporation. Interleaved digital data and voice communications system apparatus and method. 4,528,659, Cl. 370-80.000.
Jones, Herman S.; and Blackman, William C., to Cooper Industries, Inc. Power return tape. 4,527,334, Cl. 33-138.000.
Jones, James E.: *See*—
Swihart, Terence J.; and Jones, James E., 4,528,313, Cl. 524-397.000.
Jones, Lawrence T.; Lee, R. Stephen; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., to Universal International Holdings (USA). Toy storage case. 4,527,688, Cl. 206-315.100.
Jones, Leon. Dual-control fly-fishing reel. 4,527,753, Cl. 242-84.51R.
Jones, Richard W. Apparatus and method for sampling a liquid. 4,527,436, Cl. 73-863.840.
Jones, Ruth M.: *See*—
Calenoff, Emanuel; Tsay, Yuh-Geng; Jones, Ruth M.; and Scott, John R., 4,528,267, Cl. 435-7.000.
Jorgensen, Peter; Molbaek, Jens J.; Spies, Volker; Dyhr-Mikkelsen, Poul C.; and Dam, Poul S., to Danfoss A/S. Flow regulator. 4,527,595, Cl. 138-43.000.
Joseph Galkin Corporation: *See*—
Block, Charles; and Mintz, Leon, 4,527,491, Cl. 112-104.000.
Jost, Jonathan A.: *See*—
Pedersen, Bjorn O.; and Jost, Jonathan A., 4,527,620, Cl. 165-80.00D.
Joubert, Raymond J. M.: *See*—
Forestier, Alexandre; and Joubert, Raymond J. M., 4,527,952, Cl. 416-220.00R.
Jumelle, Louis F.; and Soligny, Marcel R., to Societe Nationale d'Etude et Je Construction de Moteurs d'Aviation "S.N.E.C.M.A." . Sealing device for turbine blades of a turbojet engine. 4,527,385, Cl. 60-39.070.
Juntti, Lars. Apparatus for cutting out strips from flexible webs. 4,527,750, Cl. 242-56.00R.
Juodikis, Peter; and Martinich, Steven J., to GCA Corporation. Automatic distillation apparatus. 4,528,635, Cl. 364-501.000.
Jupin, Alain; and Schneider, Bernard, to Cebal. Closure device for a necked container. 4,527,700, Cl. 215-32.000.
Jurkovic, Paul J.; and Burrington, George C., to Parker Hannifin Corporation. Crimping machine with split die ring. 4,527,414, Cl. 72-402.000.
Justice, David D.: *See*—
Fair, David L.; Justice, David D.; and Woodard, Kenneth E., Jr., 4,528,077, Cl. 204-95.000.
Juve, Robert J., to McGraw-Edison Company. Hoist-type material finishing line. 4,527,508, Cl. 118-425.000.
Juzswik, David L.: *See*—
Floyd, William M.; Webb, Nathaniel; and Juzswik, David L., 4,528,662, Cl. 370-92.000.
KabiVitrum AB: *See*—
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Kabushiki Kaisha Daikin Seisakusho: *See*—
Hamada, Tooru; Tanaka, Hirohisa; and Ishihara, Tomoo, 4,527,679, Cl. 192-3.580.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Sashiki, Takashi; and Sakaeda, Keiko, 4,527,645, Cl. 177-1.000.
Ueda, Kenji, 4,527,647, Cl. 177-105.000.
Kabushiki Kaisha Kawakami Seisakusho: *See*—
Nasu, Nobuo, 4,527,789, Cl. 270-31.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; Miyazaki, Jun; Fujimoto, Takahiko; and Nakata, Hitoshi, 4,527,615, Cl. 164-468.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Itow, Koichiro; and Komiyama, Kunihiko, 4,527,995, Cl. 44-56.000.

Kabushiki Kaisha Meidensha: *See*—
Senba, Katsuaki; and Warabi, Junichi, 4,528,432, Cl. 200-144.00B.
Kabushiki Kaisha Riken: *See*—
Suzuki, Kazuma, 4,527,547, Cl. 126-444.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Murase, Makoto; and Usuki, Arimitsu, 4,528,122, Cl. 252-518.000.
Kabushiki Kaisha Vitamin Kenkyuso: *See*—
Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, 4,528,184, Cl. 424-79.000.
Kabushiki Kaisha Yaskawa Denki Seisakusho: *See*—
Nio, Satoru; Sato, Shinobu; Nobayashi, Shigemi; and Hamashima, Toyoji, 4,528,632, Cl. 364-169.000.
Kabushiki Kaisya Advance Kaihatsu Kenkyujo: *See*—
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Kabushikikaisha Riken: *See*—
Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kentei, 4,528,045, Cl. 148-35.000.
Kade, Alexander: *See*—
Agarwal, Paul D.; Fruechte, Roger D.; Kade, Alexander; and Radomski, Thomas A., 4,527,653, Cl. 180-79.100.
Kadekodi, Narayan K.; Shey-Ping, Larry S.; and Ibrahim, Abd-El-Fattah A., to Xerox Corporation. High resolution quadrilinear CCD imager. 4,528,594, Cl. 358-213.000.
Kaegi, Dennis D.: *See*—
DuBroff, William; Kaegi, Dennis D.; Knoerzer, Jerome J.; and Spearin, Elliott Y., 4,528,069, Cl. 201-20.000.
Kagi, Bruno, to Maschinenfabrik Sulzer-Ruti AG. Method and apparatus for cleaning the reed of a weaving machine. 4,527,596, Cl. 139-1.00C.
Kaiho, Keisuke; and Nagata, Hidetoshi, to Toyo Ink Manufacturing Co., Ltd. Transparent laminates. 4,528,234, Cl. 428-216.000.
Kaiser, Fritz: *See*—
Nied, Roland; Horlamus, Herbert; and Kaiser, Fritz, 4,528,091, Cl. 209-139.00R.
Kaiser, Gunther: *See*—
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Kali-Chemie Aktiengesellschaft: *See*—
Meier zu Koecker, Heinz; Walter, Robert; and Schmidt, Torsten, 4,528,170, Cl. 423-245.000.
Kalz, Hans-Jurgen: *See*—
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Kamamori, Hitoshi: *See*—
Sano, Yutaka; Iwasa, Koji; Kamamori, Hitoshi; Suginoya, Mitsuru; and Terada, Yumiko, 4,528,073, Cl. 204-15.000.
Kameda, Takashi: *See*—
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Kamimura, Tetsuro: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,527,756, Cl. 242-68.300.
Kamionka, Harvey E.; Pence, Jerry W.; and Tran, Dat M., to International Business Machines Corporation. Method and apparatus for allocating memory space based upon free space in diverse memory devices. 4,528,624, Cl. 364-200.000.
Kamiyama, Shin-ichi, to Ricoh Company Ltd. Mounting structure for cylindrical photosensitive member. 4,527,883, Cl. 355-3.0DR.
Kampfer, Konrad: *See*—
Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, 4,528,099, Cl. 210-489.000.
Kanagawa Prefectural Government, The: *See*—
Yokogawa, Tetsuya; Futami, Ryuhei; and Kawahara, Saburo, 4,528,001, Cl. 55-37.000.
Kanai, Akira: *See*—
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Kanari, Issei: *See*—
Emura, Junichi; Kanari, Issei; and Saito, Hideaki, 4,527,676, Cl. 188-299.000.
Kane, James, to RCA Corporation. Method of fabricating lenticular arrays. 4,528,260, Cl. 430-321.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kira, Kazuaki, 4,528,343, Cl. 528-26.000.
Kaneko, Hideo; Kumashiro, Hatsuyoshi; and Iwata, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Horizontal continuous casting installation. 4,527,616, Cl. 164-502.000.
Kaneko, Ichiro: *See*—
Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Kaneko, Ichiro, 4,528,336, Cl. 526-62.000.
Kaneko, Masaharu: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
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Tominaga, Akira, 4,528,363, Cl. 528-370.000.
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Kantou, Masaharu: *See*—
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Kao Corporation: *See*—
Ito, Hiroshi; Hasegawa, Kyusei; Takeuchi, Takashi; and Ikenaga, Takayuki, 4,528,105, Cl. 252-8.55D.
Kapur, Jagdish C.: *See*—
Henniger, Peter W.; van der Drift, Johannes K.; Kapur, Jagdish C.; and Fasel, Herman P., 4,528,135, Cl. 260-245.20R.
Karami, Hamzeh, to Colgate-Palmolive Company. Elasticized disposable diaper. 4,527,989, Cl. 604-385.00A.
Karanewsky, Donald S.: *See*—
Varma, Ravi K.; and Karanewsky, Donald S., 4,528,138, Cl. 260-397.450.
Karasawa, Hiroyuki: *See*—
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Karasawa, Tadahiko: *See*—
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Kardos, Julianna; Maksay, Gabor; and Simonyi, Miklos, to MTA Kozponti Kemiai Kutato Intezet. Process and preparation for the quantitative determination of substances able to bind to cerebral receptors and a process for preparing the preparation. 4,528,131, Cl. 260-112.00R.
Karhumaki, Markku; and Jarvinen, Rauno. Spike plate and method and device for manufacturing it. 4,527,933, Cl. 411-463.000.
Karl Mayer Testilmaschinenfabrik GmbH: *See*—
Bogucki-Land, Bogdan, 4,528,631, Cl. 364-470.000.
Karlsen, Oystein: *See*—
Stahl, Torbjorn; Hektoen, Per; and Karlsen, Oystein, 4,528,054, Cl. 156-226.000.
Kasafirek, Evzen; Fric, Premysl; Slaby, Jan; and Robalova, Alena, to SPOFA, spojene podniky pro zdravotnickou vyrobu. Biologically active tripeptide and tetrapeptide alkylamides, and method for the preparation thereof. 4,528,133, Cl. 260-112.50R.
Kasai, Yoshiaki; Hiraoka, Yasuo; Yuasa, Masaharu; Harada, Masataka; and Saito, Masao, to Fuji Jukogyo Kabushiki Kaisha. Fuel-vapor emission control system for an automotive engine. 4,527,532, Cl. 123-520.000.
Kasama, Masatoshi; and Nakai, Kohzo, to Kinugawa Pacific Kabushiki Kaisha. Locking means for a fixing band of a diving mask. 4,527,292, Cl. 2-452.000.
Kaspar, Vaclav: *See*—
Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, 4,527,746, Cl. 241-23.000.
Kastin, Howard. Hard candy composition. 4,528,206, Cl. 426-660.000.
Kastler, Joel R.: *See*—
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Kastrup, Rodney V.: *See*—
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Kataoka, Hironori: *See*—
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Katchman, Arthur: *See*—
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Kato, Hideo: *See*—
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Kato, Nobuhide; and Murase, Takao, to NGK Insulators, Ltd. Oxygen sensor with heater. 4,528,086, Cl. 204-427.000.
Katsuoka, Tatsuzo, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle. 4,527,831, Cl. 297-243.000.
Katz, Hart V., to International Acoustics Incorporated. Sound monitoring apparatus. 4,528,689, Cl. 381-67.000.
Kaufman, Lazar. Handle for a shopping cart. 4,527,813, Cl. 280-654.000.
Kawachi, Yasunori: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,528,330, Cl. 525-85.000.
Kawaguchi, Ikuo: *See*—
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Kawahara, Akira, to Ryusyo Industrial Co., Ltd. Clasping device. 4,527,309, Cl. 24-68.0CD.
Kawahara, Saburo: *See*—
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Kawamura, Atsushi: *See*—
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Kawasaki, Akihisa: *See*—
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Kawasaki, Hiroshi: *See*—
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Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kaneko, Hideo; Kumashiro, Hatsuyoshi; and Iwata, Akira, 4,527,616, Cl. 164-502.000.
Kawasaki Steel Corporation: *See*—
Ikariishi, Koichi; Kitano, Toshiaki; Shinohara, Masanori; and Shimoji, Yasuo, 4,527,915, Cl. 384-480.000.
Kawashima, Takai: *See*—
Matsuo, Yoshiho; Nishijima, Ryoji; Yoshino, Atsuhiko; and Kawashima, Takai, 4,528,151, Cl. 264-83.000.

Kay, Arthur S., to Burco-Dean Limited. Gas hotplate. 4,527,539, Cl. 126-39.00R.

Kazumichi, Shudo: *See—*
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Kearney & Trecker Corporation: *See—*
Johnstone, Richard; and Kirkham, Edward E., 4,527,661, Cl. 184-6.100.

Kearns, Vaughn, to United Aircraft Products, Inc. Machine tool apparatus. 4,527,785, Cl. 269-71.000.

Kebede, Berhanu; and George, Marion L., to International Telephone & Telegraph Corp. Modulating control valve. 4,527,772, Cl. 251-138.000.

Keefe, Donald J.; and Despe, Oscar D. DC-AC converter for supplementing an AC power source. 4,528,457, Cl. 307-46.000.

Kees, Kenneth L.: *See—*
Musser, John H.; and Kees, Kenneth L., 4,528,392, Cl. 560-43.000.

Keim, Thomas A., to General Electric Company. Switch for fine adjustment of persistent current loops in superconductive circuits. 4,528,532, Cl. 335-216.000.

Keith, Laura E.: *See—*
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Keledjian, Gaston: *See—*
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Kelm, Joachim: *See—*
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Kemenater, Christof: *See—*
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Kemmel, Patrice J., to Pfaff Haushaltmaschinen GmbH. Sewing machine with a spooling mechanism. 4,527,496, Cl. 112-279.000.

Kenig, Krystyna: *See—*
Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, 4,528,116, Cl. 252-299.630.

Kent, William C.; and Payne, Charles H., to AT&T Technologies, Inc. Method and apparatus for applying stripes of solder to articles. 4,527,731, Cl. 228-180.200.

Keough, Robert F.; and Meadows, George E., to United States of America, Energy. Lithium purification technique. 4,528,032, Cl. 75-66.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Dittrich, Hans; and Frey, Hartmut, 4,528,003, Cl. 55-158.000.

Kerr, Alexander F.; and Kiyoshima, Hiroshi, to Singer Company, The. Differential feed system with safety device. 4,527,497, Cl. 112-313.000.

Ketchen, Mark B., to International Business Machines Corporation. Low temperature electronic package having a superconductive interposer for interconnecting strip type circuits. 4,528,530, Cl. 333-246.000.

Khoe, Giok D., to U.S. Philips Corporation. Distribution system for a local fibre network. 4,528,695, Cl. 455-612.000.

Kigasawa, Kazuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, to Grelan Pharmaceutical Co., Ltd. N-Phthalidyl-5-fluorouracils. 4,528,372, Cl. 544-310.000.

Kim, Jason J. Method and apparatus for producing an electron beam from a thermionic cathode. 4,528,474, Cl. 313-346.00R.

Kim, Jong Seong. Process for preparing an antitoxic composition. 4,528,192, Cl. 424-195.100.

Kimberly-Clark Corporation: *See—*
Sigl, Wayne C., 4,527,990, Cl. 604-385.00A.
Sorens, Dave A., 4,528,316, Cl. 524-503.000.

Kimberly Hills, Ltd.: *See—*
Wolf, Rodney A.; and Zech, Alan G., 4,527,544, Cl. 126-419.000.

Kimble, Kenneth B.; and Bresson, Clarence R. Process for producing trithiocarbonic acid esters. 4,528,141, Cl. 260-455.00B.

Kimura, Hiroshi, to Toshiba Silicone Co., Ltd. Preparation of polymethylsilsesquioxane. 4,528,390, Cl. 556-450.000.

Kimura, Seiji: *See—*
Nishida, Susumu; Fuchigami, Tadashi; Kimura, Seiji; Kishi, Shunsaku; and Kobayashi, Akio, 4,527,624, Cl. 165-184.000.

King-Seeley Thermos Co.: *See—*
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Kingsbury, Charles M.: *See—*
Abbott, Vaughan; Beckwith, Bruce R.; Kingsbury, Charles M.; Mungovan, John P.; and Mills, Elden H., 4,528,017, Cl. 65-240.000.

Kingston, Michael F. E., to Air Products and Chemicals, Inc. Apparatus for shielding molten metal during teeming. 4,527,718, Cl. 222-603.000.

Kinoshita, Hiroo: *See—*
Suzuki, Yoshihiro; Kinoshita, Hiroo; Sato, Masayasu; and Ohara, Masanori, 4,528,279, Cl. 502-200.000.

Kinoshita, Takao: *See—*
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Kinugawa, Masumi: *See—*
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Kinugawa Pacific Kabushiki Kaisha: *See—*
Kasama, Masatoshi; and Nakai, Kohzo, 4,527,292, Cl. 2-452.000.

Kira, Kazuaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Antithrombogenic elastomer, molded products of the same, and a process for manufacturing the same. 4,528,343, Cl. 528-26.000.

Kirchner, Richard N. Automatic fire extinguishing apparatus. 4,527,635, Cl. 169-26.000.

Kirkham, Edward E.: *See—*
Johnstone, Richard; and Kirkham, Edward E., 4,527,661, Cl. 184-6.100.

Kirkpatrick, John A.: *See—*
Budrean, John D.; and Kirkpatrick, John A., 4,527,413, Cl. 72-349.000.

Kirsinas, Peter: *See—*
Moody, Roy A.; Kirsinas, Peter; and Turek, James A., 4,527,328, Cl. 29-749.000.

Kirtland, Howard W., to Carrier Corporation. Variable width diffuser. 4,527,949, Cl. 415-150.000.

Kish, Paul P.; and Discenza, Giovanni J., to Northern Telecom Limited. Color coding identification of conductors in telecommunications cable. 4,528,420, Cl. 174-112.000.

Kishi, Norimasa: *See—*
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,528,687, Cl. 381-43.000.

Kishi, Noriyuki: *See—*
Hasegawa, Shumpei; and Kishi, Noriyuki, 4,527,521, Cl. 123-326.000.

Kishi, Shunsaku: *See—*
Nishida, Susumu; Fuchigami, Tadashi; Kimura, Seiji; Kishi, Shunsaku; and Kobayashi, Akio, 4,527,624, Cl. 165-184.000.

Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, to Mitsubishi Rayon Co., Ltd. Resin composition usable without being coated. 4,528,330, Cl. 525-85.000.

Kishida, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Porcelain gas-filled bushing with electrodes for moderating the electric field. 4,528,421, Cl. 174-143.000.

Kita, Toshio; Ikeda, Nobumasa; Takusagawa, Takashi; Goto, Yoshiharu; Hayakawa, Hiroshi; and Togashi, Minoru, to Bridgestone Tire Company Limited. Pneumatic radial tires for passenger cars having low rolling resistance and excellent slipping resistance. 4,527,606, Cl. 152-209.00R.

Kitabchi, Abbas E.: *See—*
Stentz, Frankie B.; Wright, Reba K.; and Kitabchi, Abbas E., 4,528,134, Cl. 260-112.700.

Kitaguchi, Hiroshi; and Naito, Hideki, to Fuji Photo Film Co., Ltd. Process for forming image. 4,528,258, Cl. 430-203.000.

Kitajima, Masahiko: *See—*
Kondoh, Takehiko; and Kitajima, Masahiko, 4,527,973, Cl. 432-58.000.

Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, to Fuji Photo Film Company, Ltd. Ion selective electrode and process of preparing the same. 4,528,085, Cl. 204-416.000.

Kitamura, Hajime: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Kaneko, Ichiro, 4,528,336, Cl. 526-62.000.

Kitamura, Takashi, to Canon Kabushiki Kaisha. Information output device for recording information with varied resolution. 4,528,561, Cl. 340-745.000.

Kitano, Toshiaki: *See—*
Ikariishi, Koichi; Kitano, Toshiaki; Shinohara, Masanori; and Shimoji, Yasuo, 4,527,915, Cl. 384-480.000.

Kiyoshima, Hiroshi: *See—*
Kerr, Alexander F.; and Kiyoshima, Hiroshi, 4,527,497, Cl. 112-313.000.

Klann, Horst. Spring cramp. 4,527,782, Cl. 267-177.000.

Klaus, Hermann: *See—*
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, 4,528,174, Cl. 423-488.000.

Kledewski, Peter: *See—*
Ilgner, Hartmut; Kledewski, Peter; and Heun, Reinhard, 4,528,147, Cl. 261-128.000.

Klee, David J., to Air Products and Chemicals, Inc. Thermally insulated chamber. 4,527,844, Cl. 312-214.000.

Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, to Siemens Aktiengesellschaft. Method for the manufacture of epoxy resin molding materials. 4,528,358, Cl. 528-94.000.

Klefbeck, Robert J. Signal light for fishing rods and tip ups. 4,528,554, Cl. 340-573.000.

Klein, Harvey A. Method and device for making a twisted wire connection with reduced incidence of breakage. 4,527,554, Cl. 128-92.00B.

Klein, Julian L.; Nelson, James A.; and Smith, Terrence J., to Ryko Manufacturing Company. Automatic vehicle washer. 4,527,578, Cl. 134-57.00R.

Klein, Thomas E.: *See—*
Morgan, John W., II; and Klein, Thomas E., 4,528,672, Cl. 373-75.000.

Klein, Walter; and Mangold, Hans, to Grundig E.M.V. Television set. 4,528,597, Cl. 358-254.000.

Kleinhans, Michel; and Gaffre, Michel, to U.S. Philips Corporation. Method of manufacturing a single crystal of a III–V compound. 4,528,062, Cl. 156-611.000.

Klemm, Gunter, to Hydroc Gesteinsbohrtechnik GmbH. Percussion tool. 4,527,641, Cl. 175-92.000.

Kline, Charles M., to Sperry Corporation. Drive chain adjuster. 4,527,655, Cl. 180-246.000.

Kline, Jacob: *See*—
Eckstein, Eugene C.; Block, Norman L.; Kline, Jacob; and Pinchuk, Leonard, 4,527,293, Cl. 623-12.000.

Klingler, Thomas C.: *See*—
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., 4,528,384, Cl. 549-78.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Weber, Thomas, 4,527,622, Cl. 165-166.000.

Klusman, Steven A., to General Motors Corporation. Squeeze film damper. 4,527,912, Cl. 384-99.000.

Kluss, Bruno: *See*—
Prinz, Eckhard; and Kluss, Bruno, 4,527,969, Cl. 425-174.80E.

Knemeyer, Friedel S., to General Electric Company. Brazed composite compact implements. 4,527,998, Cl. 51-309.000.

Knoerzer, Jerome J.: *See*—
DuBroff, William; Kaegi, Dennis D.; Knoerzer, Jerome J.; and Spearin, Elliott Y., 4,528,069, Cl. 201-20.000.

Knopf, Robert J.; and Drake, Kenneth, to Union Carbide Corporation. Carboxylated poly(oxyalkylenes). 4,528,334, Cl. 525-404.000.

Knotter, David G.; and Numbers, Jody L., to Knotter, David G. Cane. 4,527,579, Cl. 135-74.000.

Knowlen, Bruce R.: *See*—
Brock, Gregory K.; and Knowlen, Bruce R., 4,528,651, Cl. 367-99.000.

Knowlton, Ruth H.; and Huang, Hsin, to Norton Christensen, Inc. Earth-boring drill bit with rectangular nozzles. 4,527,642, Cl. 175-329.000.

Knudsen, Ronald D., to Phillips Petroleum Company. Ethylene dimerization. 4,528,415, Cl. 585-527.000.

Kobata, Fumihiro: *See*—
Sugie, Toshinori; Ishikawa, Ryoichi; and Kobata, Fumihiro, 4,528,346, Cl. 525-523.000.

Kobayashi, Akio: *See*—
Nishida, Susumu; Fuchigami, Tadashi; Kimura, Seiji; Kishi, Shunsaku; and Kobayashi, Akio, 4,527,624, Cl. 165-184.000.

Kobori, Shigeyuki: *See*—
Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; Kobori, Shigeyuki; and Nishihara, Motohisa, 4,527,428, Cl. 73-721.000.

Koch, John W., to Orbital Engine Company Proprietary Limited. Lubrication of an ancillary pump fitted to an engine. 4,527,520, Cl. 123-196.00R.

Kodama, Naoki: *See*—
Sugita, Yutaka; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Ikeda, Tadashi, 4,528,645, Cl. 365-36.000.

Kodatsky, William K.: *See*—
Hacetoglu, Ararat; and Kodatsky, William K., 4,528,031, Cl. 75-53.000.

Koenen, Richard A.: *See*—
Miles, Thomas P.; and Koenen, Richard A., 4,528,567, Cl. 343-442.000.

Koerner, David J.: *See*—
Stogner, Clarence H.; and Koerner, David J., 4,527,769, Cl. 251-14.000.

Kohls, John B., to Berkoh Company, Inc. Timer. 4,527,905, Cl. 368-93.000.

Kohn, David H.: *See*—
Cooper, Emanuel; and Kohn, David H., 4,528,164, Cl. 423-1.000.

Kohno, Michinaga; Sugimoto, Koichi; and Nakagawa, Yasuo, to Hitachi, Ltd. Part feeding and assembling system. 4,527,326, Cl. 29-705.000.

Koike, Tetuo: *See*—
Koyanagi, Yuzo; Koike, Tetuo; Suzuki, Takayuki; and Shiozaki, Tadakazu, 4,527,531, Cl. 123-501.000.

Koinuma, Yutaka: *See*—
Osaki, Kiyoshi; and Koinuma, Yutaka, 4,527,518, Cl. 123-90.230.

Koizumi, Koichi: *See*—
Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, 4,528,074, Cl. 204-16.000.

Koizumi, Michio; Iwata, Yasuo; and Ohsawa, Seiichi, to Citizen Watch Co., Ltd. Paper feed apparatus for shuttle printer. 4,527,921, Cl. 400-618.000.

Kojima, Tetsuro: *See*—
Ishiguro, Shoji; Mifune, Hiroyuki; Fuseya, Yoshiharu; and Kojima, Tetsuro, 4,528,264, Cl. 430-609.000.

Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, to Laurel Bank Machine Co., Ltd. Device for locking front cover of bank note container box for use in automatic money depositing and disbursing machine. 4,527,845, Cl. 312-215.000.

Kolb, Peter J., to South African Inventions Develop. Corp. Device for guiding a surgical needle into a blood vessel. 4,527,569, Cl. 128-660.000.

Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., to Allied Corporation. Urease inhibited urea based fertilizer compositions. 4,528,020, Cl. 71-28.000.

Kolze, Lawrence P., to Eaton Corporation. A.C. solenoid three way pilot valve. 4,527,590, Cl. 137-596.170.

Komatsu, Akio: *See*—
Ichikawa, Akira; Komatsu, Akio; and Asakawa, Yoshiaki, 4,528,688, Cl. 381-43.000.

Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, to Pioneer Electronic Corporation. Cassette tape machine. 4,527,756, Cl. 242-68.300.

Komatsuzaki, Nobuyuki; Tsubone, Masahiro; and Machida, Bon, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Polystyrene foamed sheet suitable for forming. 4,528,221, Cl. 428-35.000.

Komeda, Kenichiro: *See*—
Hatta, Koichi; and Komeda, Kenichiro, 4,528,638, Cl. 364-709.000.

Komiyama, Kunihiko: *See*—
Itow, Koichiro; and Komiyama, Kunihiko, 4,527,995, Cl. 44-56.000.

Komon, Koichi: *See*—
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, 4,527,507, Cl. 118-314.000.

Kon, Tatsuya: *See*—
Uno, Hitoshi; Karasawa, Tadahiko; Kon, Tatsuya; and Ito, Tsugutaka, 4,528,299, Cl. 514-428.000.

Kondo, Hiroyuki; Yoshimura, Yoshikane; and Nomura, Yoshihisa, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Reservoir assembly. 4,527,709, Cl. 220-22.000.

Kondoh, Takehiko; and Kitajima, Masahiko, to UBE Industries, Ltd. Precalciner for cement raw meal. 4,527,973, Cl. 432-58.000.

Konigshofen, Heinrich: *See*—
Arend, Gunter; Konigshofen, Heinrich; Muller, Peter; and Musch, Rudiger, 4,528,388, Cl. 549-448.000.

Konishi, Sakuichi; Shingo, Naohito; and Shibayama, Mathuo, to Nippon Paint Co., Ltd. Aqueous coating composition, and its production. 4,528,318, Cl. 524-504.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,528,263, Cl. 430-544.000.

Konneker, Reinhard: *See*—
Mezger, Hans; Konneker, Reinhard; and Kelm, Joachim, 4,527,517, Cl. 123-41.470.

Konrad, Eugen: *See*—
Lang, Gunther; Wendel, Harald; and Konrad, Eugen, 4,528,283, Cl. 514-55.000.

Kookootsedes, Gust J.; and Reese, Herschel H., to Dow Corning Corporation. Method for surface treatment of polyorganosiloxane gel-filled containers to prevent bubble migration into said gel. 4,528,243, Cl. 428-425.500.

Kopich, Leonard F., to General Motors Corporation. Sunroof latch. 4,527,822, Cl. 292-257.000.

Koppensteiner, James V., to GTE Automatic Electric Inc. Printed wiring board enclosure. 4,528,616, Cl. 361-399.000.

Koppers Company, Inc.: *See*—
Lindgren, Carl, 4,527,488, Cl. 105-247.000.

Korowitz, Simon: *See*—
Esterling, Robert J.; Freed, Clarence L.; Weiss, Edward L.; and Korowitz, Simon, 4,528,675, Cl. 375-9.000.

Korrasik, Anita C.: *See*—
Spathis, George; and Korrasik, Anita C., 4,528,217, Cl. 428-5.000.

Kos, Peter: *See*—
Spilkin, Gordon; Eichler, Jack H.; and Kos, Peter, 4,528,103, Cl. 210-791.000.

Koshinaka, Eiichi: *See*—
Itoh, Yasuo; Kato, Hideo; Ogawa, Nobuo; Koshinaka, Eiichi; Suzuki, Tomio; and Yagi, Noriyuki, 4,528,287, Cl. 514-254.000.

Kossor, Albert A.; and Kossor, Julius A. Automobile ventilation exhaust and rain shield. 4,527,466, Cl. 98-2.130.

Kossor, Julius A.: *See*—
Kossor, Albert A.; and Kossor, Julius A., 4,527,466, Cl. 98-2.130.

Kosugi, Tetuo: *See*—
Matsushita, Yasuo; Nakamura, Kousuke; and Kosugi, Tetuo, 4,528,121, Cl. 252-516.000.

Kotake, Kazuyoshi: *See*—
Jimbo, Yoshiji; and Kotake, Kazuyoshi, 4,528,487, Cl. 318-338.000.

Kotani, Toshihiro: *See*—
Miyazawa, Shintaro; Nanishi, Yasushi; Tada, Kohji; Kawasaki, Akihisa; and Kotani, Toshihiro, 4,528,061, Cl. 156-605.000.

Koterasawa, Matsuro: *See*—
Naokawa, Toyojiro; and Koterasawa, Matsuro, 4,528,496, Cl. 323-315.000.

Kotliar, Abraham M.: *See*—
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,528,235, Cl. 428-220.000.

Koumura, Noboru; Mitzusawa, Nobutoshi; and Ozawa, Kunitaka, to Canon Kabushiki Kaisha. Recording apparatus. 4,528,576, Cl. 346-140.00R.

Koumura, Noboru: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,527,885, Cl. 355-3.00R.

Koyama, Tsuneyuki, to Victor Company of Japan Ltd. Tape end detecting device in a recording and/or reproducing apparatus for a miniature type tape cassette. 4,528,604, Cl. 360-74.200.

Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Kaneko, Ichiro, to Shin-Etsu Chemical Co., Ltd. Method for preventing polymer scale deposition in polymerization of ethylenically unsaturated monomers. 4,528,336, Cl. 526-62.000.

Koyanagi, Yuzo; Koike, Tetuo; Suzuki, Takayuki; and Shiozaki, Tadakazu, to Sanwa Seiki Mfg., Co. Ltd. Method of detecting fuel injection timing. 4,527,531, Cl. 123-501.000.

Koyo Seiko Company Limited: *See*—
Ikariishi, Koichi; Kitano, Toshiaki; Shinohara, Masanori; and Shimoji, Yasuo, 4,527,915, Cl. 384-480.000.

Kozaki, Shuichi: *See*—
Ishii, Yutaka; Minezaki, Shigehiro; Kozaki, Shuichi; and Funada, Fumiaki, 4,528,115, Cl. 252-299.630.

Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, to BASF Aktiengesellschaft. Copper complexes, their preparation, their use in controlling plant pests, and agents for such control. 4,528,185, Cl. 424-81.000.

Krambrock, Wolfgang; and Hoppe, Hans, to Waeschle Maschinenfabrik GmbH. Air classifier. 4,528,092, Cl. 209-139.00R.

Krass, Dennis K.; and Richter, Sidney B., to PPG Industries, Inc. Herbicidally active quinoline or quinoxaline acetophenone oxime derivatives. 4,528,025, Cl. 71-92.000.

Krause, Vernon C. Dry soap dispenser. 4,527,764, Cl. 248-309.100.

Krauss, Rudolf: *See*—
Hafner, Udo; Krauss, Rudolf; and Langer, Werner, 4,527,744, Cl. 239-585.000.

Krebser, Werner; and Schmidt, Karl H. Centrifugal casting machine with means for balancing by interconnection of balancing mass and muffler holder. 4,527,610, Cl. 164-287.000.

Kreienbrink, Volker: *See*—
Dorpmund, Willi; and Kreienbrink, Volker, 4,527,765, Cl. 248-346.000.

Kreilein, Kurt; Geschonke, Hans; Rummel, Wolfgang; and Wiemer, Hardo, to Wacker-Chemie GmbH. Process and apparatus for manufacturing vinyl chloride polymers. 4,528,337, Cl. 526-70.000.

Krenz, Horst M., to Heath Company. Video display tilt apparatus. 4,527,766, Cl. 248-371.000.

Kretzschmar, Klaus: *See*—
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,528,358, Cl. 528-94.000.

Kroenchen, Theo: *See*—
Strausfeld, Hermann; and Kroenchen, Theo, 4,527,971, Cl. 425-409.000.

Krup MaK Maschinenbau GmbH: *See*—
Schmitt, Josef, 4,527,502, Cl. 114-319.000.

Krupka, Yaakov: *See*—
Fischler, Henryk; Krupka, Yaakov; and Behar, Salamon, 4,527,5o7, Cl. 128-419.0PT.

Krutzfeldt, Herbert: *See*—
Straszewski, Klaus; Ender, Erhard; and Krutzfeldt, Herbert, 4,527,317, Cl. 24-641.000.

Kubota Ltd.: *See*—
Shinosaki, Akira; and Amako, Shinji, 4,527,411, Cl. 72-340.000.

Kuit, Johannes H.: *See*—
Polderman, Arie; Handels, Johannes W. H.; and Kuit, Johannes H., 4,528,257, Cl. 430-109.000.

Kumashiro, Hatsuyoshi: *See*—
Kaneko, Hideo; Kumashiro, Hatsuyoshi; and Iwata, Akira, 4,527,616, Cl. 164-502.000.

Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, to Hitachi, Ltd.; Hitachi Chemical Co., Ltd.; and Fuji Fiber Glass Co., Ltd. Composite fibrous product. 4,528,223, Cl. 428-36.000.

Kumei, Yasuhiro: *See*—
Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, 4,528,034, Cl. 75-255.000.

Kump, Howard H.; and Collins, William F., to General Electric Company. X-ray beam filter device. 4,528,685, Cl. 378-157.000.

Kunde, Wayne C.; and Robitaille, Martial J., to Kunde, Wayne C. Apparatus for cleaning the bead seating profile of a tire rim. 4,527,300, Cl. 15-21.00C.

Kung, David, to National Semiconductor Corporation. Bipolar digital peripheral driver transistor circuit. 4,528,463, Cl. 307-270.000.

Kuntz, Paul: *See*—
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,528,504, Cl. 324-158.00F.

Kunz, Walter: *See*—
Eckhardt, Wolfgang; and Kunz, Walter, 4,528,284, Cl. 514-84.000.

Kurata, Keiji: *See*—
Ohsawa, Kenji; Ito, Takao; Ohsawa, Masayuki; and Kurata, Keiji, 4,528,064, Cl. 156-630.000.

Kurihara, Hideo: *See*—
Hayashi, Osamu; Kurihara, Hideo; and Matsumoto, Yukio, 4,528,340, Cl. 525-379.000.

Kuroda, Hideyuki: *See*—
Numakami, Hajime; and Kuroda, Hideyuki, 4,527,355, Cl. 49-82.000.

Kurono, Masayasu; Yamaguchi, Takuji; and Usui, Toshinao, to Sanwa Kagaku Kankyusho Co. Ltd. Process for the preparation of 4-chloro-2-nitrobenzonitrile. 4,528,143, Cl. 260-465.00G.

Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, to Kabushiki Kaisha Vitamin Kenkyuso. Polymer-metal complexes containing quaternary nitrogen atoms used in the treatment of hypercholesteremia. 4,528,184, Cl. 424-79.000.

Kurosaki, Shiro: *See*—
Edahiro, Takao; Inagaki, Nobuo; and Kurosaki, Shiro, 4,528,010, Cl. 65-18.100.

Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, to Fujitsu Limited. Process for manufacturing hollow multilayer printed wiring board. 4,528,072, Cl. 204-15.000.

Kurosu, Tomio; and Yoshikawa, Yukio, to Copal Company Limited. Device for detecting the time of termination of opening operation of shutter blades of an electromagnetic programming shutter. 4,527,877, Cl. 354-234.100.

Kuster, Erich: *See*—
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,528,350, Cl. 526-307.000.

Kusuki, Yoshihiro: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,528,004, Cl. 55-158.000.

Kuwayama, Meiji: *See*—
Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, 4,528,184, Cl. 424-79.000.

Kyoto Ceramic Co., Ltd.: *See*—
Inamori, Kazuo; and Gotoda, Katsuhiko, 4,527,886, Cl. 355-3.00R.

LA "GROG" S.r.l.: *See*—
Maione, Claudio, 4,528,218, Cl. 428-35.000.

LaConti, Anthony B.; Enos, John F.; Dempsey, Russell M.; and Fragala, Anthony R., to United Technologies Corporation. Device for evolution of oxygen with ternary electrocatalysts containing valve metals. 4,528,083, Cl. 204-265.000.

Lacore, Brian C. Tank flushing apparatus. 4,527,295, Cl. 4-321.000.

Lacour, Alain P.; Langlois, Michel; Jalfre, Maurice F.; and Bucher, Bernard P., to Delalande S.A. 5-(1-Propyl)n-butyl tetrazoles. 4,528,380, Cl. 548-250.000.

LaCroix, Michael G.: *See*—
Haeg, Steven R.; and LaCroix, Michael G., 4,527,416, Cl. 73-11.000.

Lafrance, Conrad D.: *See*—
Fatovic, Peter; and Lafrance, Conrad D., 4,528,426, Cl. 179-121.00D.

Lagakos, Nicholas: *See*—
Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,528,011, Cl. 65-30.130.

Lai, John T. Polysubstituted 2-morpholones. 4,528,370, Cl. 544-173.000.

Laiacano, Joseph A.: *See*—
Petric, Paul F.; Foley, Michael S.; Utlaut, Mark W.; and Laiacano, Joseph A., 4,528,451, Cl. 250-441.100.

Lambert, Scott M.: *See*—
Abbott, Vaughan; Morris, Nicholas G.; Lambert, Scott M.; and Letellier, Richard A., 4,528,015, Cl. 65-162.000.

Lambert, Theodore J. Flyable ball and funnel apparatus. 4,527,801, Cl. 273-323.000.

Lamberti, Vincent: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,528,144, Cl. 260-503.000.

Lambeth, David N., to Eastman Kodak Company. Rangefinder device with serial readout linear image sensor and peak detector with threshold setting means. 4,527,891, Cl. 356-1.000.

La Monica, John A., Jr.: *See*—
Gonzales, Gilbert R.; and La Monica, John A., Jr., 4,527,757, Cl. 244-20.000.

La Mori, Phillip N.; and Shih, Chien-Cheng J., to Occidental Research Corporation. Process to abate geothermal hydrogen sulfide. 4,528,169, Cl. 423-231.000.

Land, Herbert K., III: *See*—
Ghafari, Joseph; and Land, Herbert K., III, 4,527,975, Cl. 433-8.000.

Landis, Dan R.: *See*—
Domin, Thomas M.; Landis, Dan R.; and Williams, Paul, 4,528,507, Cl. 324-229.000.

Lang, Gunther; Wendel, Harald; and Konrad, Eugen, to Wella Aktiengesellschaft. Cosmetic composition based upon chitosan derivatives, new chitosan derivatives as well as processes for the production thereof. 4,528,283, Cl. 514-55.000.

Lang, John G., to Rotesco Inc. System for centering an elongated object within a housing. 4,527,426, Cl. 73-158.000.

Lang, Warren R., to Sperry Corporation. Multi-position return to center potentiometer. 4,528,545, Cl. 338-184.000.

Langer, Werner: *See*—
Hafner, Udo; Krauss, Rudolf; and Langer, Werner, 4,527,744, Cl. 239-585.000.

Langkau, John F.: *See*—
Clark, Albert L., 4,527,599, Cl. 140-119.000.

Langlois, Michel: *See*—
Lacour, Alain P.; Langlois, Michel; Jalfre, Maurice F.; and Bucher, Bernard P., 4,528,380, Cl. 548-250.000.

Laramee, Joseph M. Gasoline preheater. 4,527,533, Cl. 123-557.000.

Larsen, Fred L.: *See*—
Carter, James H.; Ledis, Stephen L.; Crews, Harold R.; Sena, Ted; and Larsen, Fred L., 4,528,274, Cl. 436-10.000.

Larson, Donald A. Emergency repair tape. 4,528,230, Cl. 428-137.000.

Lasner, Jeffrey I.; and Aleixo, Francisco H. Suture remover and continuous band scissors. 4,527,331, Cl. 30-135.000.

Lastrina, Frank A.; Pommer, Leslie M.; and Mayer, Jeffrey C., to General Electric Company. Particle separator scroll vanes. 4,527,387, Cl. 60-39.092.

Laumont, Roger, to Hydroperfect International Hpi. Apparatus for an hydrostatic compensation of hydraulic pumps and motors of gear type. 4,527,966, Cl. 418-132.000.

Laurel Bank Machine Co., Ltd.: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,527,845, Cl. 312-215.000.

Lawrence, John E.; and Barnes, Lloyd L., Jr., to Winchester Disc, Inc. Method for refinishing rigid data storage discs. 4,528,063, Cl. 156-626.000.

Lawrie, James W.: *See*—
Mauger, David W.; Lawrie, James W.; McCarthy, John T.; and Tozzi, Michael A., 4,527,376, Cl. 53-113.000.

LCC.CICE-Compagnie Europeenne de Composants Electroniques: *See*—
Anne, Jean, 4,527,318, Cl. 29-25.420.

Leathers, Joel M., to Dow Chemical Company, The. Transducer apparatus for measuring pressure of fluids. 4,527,430, Cl. 73-745.000.

Leavitt, John P., Jr., to American Manufacturing Company, Inc. Press-loading mechanism. 4,527,938, Cl. 414-280.000.

Ledebrink, Friedrich-Wilhelm; Rosenkranz, Wolfgang; and Stoll, Wolfgang, to ALKEM GmbH. Method for dissolving hard-to-dissolve thorium and/or plutonium oxides. 4,528,130, Cl. 252-643.000.

Lederis, Karl P.; MacCannell, Keith L.; and Rivier, Jean E. F., to Salk Institute For Biological Studies, The. Urotensin peptides. 4,528,189, Cl. 514-12.000.

Ledis, Stephen L.: *See*—
Carter, James H.; Ledis, Stephen L.; Crews, Harold R.; Sena, Ted; and Larsen, Fred L., 4,528,274, Cl. 436-10.000.

Lee, Cheng H., to Abcor, Inc. Separation membrane and method of preparing and using same. 4,527,999, Cl. 55-16.000.

Lee, John T. M., to ICI Americas Inc. Emergency vapor powered pump assembly. 4,527,634, Cl. 169-13.000.

Lee, R. Stephen: *See*—
Jones, Lawrence T.; Lee, R. Stephen; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,527,688, Cl. 206-315.100.

Lee, William W. Y., to Hughes Aircraft Company. High density CMOS devices with conductively interconnected wells. 4,528,581, Cl. 357-23.110.

Leesona Corporation: *See*—
Maddox, Edward L., 4,528,556, Cl. 340-648.000.

Leger, Raymond A.: *See*—
Lewandowski, Raymond; and Leger, Raymond A., 4,528,430, Cl. 200-61.620.

Le Goff, Pierre Y. J., to Centre National de la Recherche Scientifique. Method and apparatus for recycling thermal energy. 4,527,621, Cl. 165-104.120.

Leichnitz, Kurt: *See*—
Eckstein, Wolfgang; Leichnitz, Kurt; Pannwitz, Karl-Heinz; Rabenecker, Horst; and Wolff, Gunter, 4,528,160, Cl. 422-86.000.

Leising, Frederic, to Rhone-Poulenc Specialites Chimiques. Aqueous cationic dispersions of synthetic polymers. 4,528,322, Cl. 524-829.000.

Lemaitre, Rene , to Les Cables De Lyon. System for transporting heavy cylindrical objects in a workshop. 4,527,485, Cl. 104-118.000.

Le Marchand, Claude, to Societe Anonyme D.B.A. Disc brake with sliding caliper and friction component provided with electrical wear indicator. 4,527,664, Cl. 188-1.110.

Lemmer, Helmut, to Starkstrom Gummersbach GmbH. Electromagnetic switching device. 4,528,535, Cl. 335-273.000.

Lepone, Gerald E., to Du Pont de Nemours, E. I., and Company. Herbicidal alkyl sulfones. 4,528,024, Cl. 71-92.000.

Leppik, Raymond A.: *See*—
Park, Robert J.; and Leppik, Raymond A., 4,528,272, Cl. 435-55.000.

Les Cables De Lyon: *See*—
Lemaitre, Rene , 4,527,485, Cl. 104-118.000.

Les Entreprises Tritton Ltee: *See*—
Tritton, Victor R.; Tritton, Gary E.; and Chevillard, Francis, 4,527,308, Cl. 24-30.50R.

Letellier, Richard A.: *See*—
Abbott, Vaughan; Morris, Nicholas G.; Lambert, Scott M.; and Letellier, Richard A., 4,528,015, Cl. 65-162.000.

Lettera Arabica S.a.r.l.: *See*—
Aoun, Joseph, 4,527,919, Cl. 400-111.000.

Lettner, Horst H.; Hunke, Friedrich; and Hench, Hans, to Automatik Apprate-Maschinenbau H. Hench GmbH. Feeding of molten strands to a discharge trough. 4,528,157, Cl. 264-237.000.

Leubecker, Charles W. Digital linear actuator. 4,528,468, Cl. 310-21.000.

Lever Brothers Company: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,528,144, Cl. 260-503.000.
Harris, Peter; and Yoell, Richard W., 4,528,203, Cl. 426-555.000.
Naik, Appaya R., 4,528,128, Cl. 252-549.000.
Rubin, Fred K.; Van Blarcom, David; and Fox, Daniel J., 4,528,039, Cl. 134-2.000.
Turrisi, Lisa, 4,528,205, Cl. 426-613.000.

Lew, Eugene K., to Sperry Corporation. Memory management system. 4,528,648, Cl. 365-236.000.

Lewandowski, Raymond; and Leger, Raymond A., to Cherry Electrical Products Corporation. Electrical appliance interlock switch with force efficient actuator. 4,528,430, Cl. 200-61.620.

Lewis, Henry G., Jr.; and Limberg, Allen L., to RCA Corporation. Automatic tint correction with reduced color saturation error. 4,528,586, Cl. 358-28.000.

Ley, David A.; and Cady, Susan M., to American Cyanamid Co. Low temperature, moisture cure coating composition. 4,528,320, Cl. 524-555.000.

Ley, Gregor: *See*—
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,528,185, Cl. 424-81.000.

Li, Ying H., to Atlantic Richfield Company. Process for cooling particulate solids. 4,527,342, Cl. 34-10.000.

Liang, Po-lung: *See*—
Person, Dennis W.; Pierce, Stanley L.; and Liang, Po-lung, 4,527,448, Cl. 74-869.000.

Licentia-Patent-Verwaltungs GmbH: *See*—
Burkhardt, Gisbert, 4,527,792, Cl. 271-225.000.

Lien, Qcheng S.; and Nakos, Steven T., to Loctite Corporation. Dual curing silicone, method of preparing same and dielectric soft-gel compositions thereof. 4,528,081, Cl. 204-159.130.

Lienhard, Paul; and Saar, Werner, to Ciba-Geigy Corporation. Process for mass-coloring nylon with 1:2 chromium complex azo dye. 4,527,994, Cl. 8-494.000.

Liepe, Steven F.; Radochonski, Pierre; and Johnson, Glenn R., to Tektronix, Inc. Raster scan frame digitizer method and apparatus. 4,528,591, Cl. 358-160.000.

Liepold, August: *See*—
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,527,691, Cl. 206-387.000.

Liermann, August O.: *See*—
Chung, Rack H.; Lucas, Gary M.; and Liermann, August O., 4,528,324, Cl. 524-863.000.

Liggett, Dennis: *See*—
Sallee, John P.; and Liggett, Dennis, 4,527,493, Cl. 112-121.270.

Lightbody, James D.; and Lightbody, William S. Apparatus and method for testing circuit boards. 4,528,500, Cl. 324-73.0PC.

Lightbody, William S.: *See*—
Lightbody, James D.; and Lightbody, William S., 4,528,500, Cl. 324-73.0PC.

Limberg, Allen L.: *See*—
Lewis, Henry G., Jr.; and Limberg, Allen L., 4,528,586, Cl. 358-28.000.

Lin, Chinlon: *See*—
Burrus, Charles A., Jr.; and Lin, Chinlon, 4,528,670, Cl. 372-44.000.

Lind, Erwin, to Hoechst Aktiengesellschaft. Electrophotographic recording material with condensation product. 4,528,256, Cl. 430-83.000.

Linde Aktiengesellschaft: *See*—
Linde, Gerhard, 4,528,002, Cl. 55-48.000.

Linde, Gerhard, to Linde Aktiengesellschaft. Process for separation of CO_2 from CO_2-containing gases. 4,528,002, Cl. 55-48.000.

Lindgren, Carl, to Koppers Company, Inc. Coke oven charging car. 4,527,488, Cl. 105-247.000.

Lindner, Karl-Rainer. Cutting device for cutting elongated profiles into sections. 4,527,452, Cl. 83-209.000.

Line, William F.: *See*—
Mizerak, Robert J.; Bertkau, Geoffrey H.; Line, William F.; and Chicoye, Etzer, 4,528,198, Cl. 426-16.000.

Lipp, Alfred: *See*—
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,528,120, Cl. 252-516.000.

Lipper, Karl-August: *See*—
Bockmann, Walter; Bruhne, Friedrich; and Lipper, Karl-August, 4,528,146, Cl. 260-544.00D.

Lisac, Gary E.: *See*—
Zoschg, James R.; and Lisac, Gary E., 4,527,985, Cl. 446-397.000.

Liston, Max D., to American Hospital Supply Corp. Automated analysis instrument system. 4,528,159, Cl. 422-65.000.

Litovitz, Theodore A.: *See*—
Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,528,011, Cl. 65-30.130.

Littleton, Francis J. Thermal adjustment apparatus for rotating machines. 4,527,473, Cl. 101-220.000.

Litton Industrial Products, Inc.: *See*—
Shank, William E., 4,527,357, Cl. 51-105.0SP.

Livesay, William R., to Electron Beam Corporation. Alignment and detection system for electron image projectors. 4,528,452, Cl. 250-491.100.

Lockheed Missiles & Space Company, Inc.: *See*—
Galbraith, Andrew D., 4,528,248, Cl. 429-8.000.
Galbraith, Andrew D., 4,528,249, Cl. 429-15.000.

Loctite Corporation: *See*—
Lien, Qcheng S.; and Nakos, Steven T., 4,528,081, Cl. 204-159.130.

Loeffler, Wilfried; and Oppelt, Arnulf, to Siemens Aktiengesellschaft. Device for generating images of an object under examination using nuclear magnetic resonance. 4,528,510, Cl. 324-309.000.

Loew, Gunther: *See*—
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,528,153, Cl. 264-109.000.

Lofberg, Bo. Method and apparatus for marking the information content of an information carrying signal. 4,528,588, Cl. 358-122.000.

Lohraff, Larry G.: *See*—
Gaiser, Robert F.; and Lohraff, Larry G., 4,527,395, Cl. 60-562.000.

Long, Delmar D.; and Hill, James D., Jr., to Dayco Corporation. Polymeric product having a fabric layer means and method of making the same. 4,528,214, Cl. 427-173.000.

Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., to Union Carbide Corporation. Olefin oligomerization. 4,528,414, Cl. 585-514.000.

Loor , Timothy C., to Magnaflux Corporation. Non-destructive testing system with dual scanning. 4,528,455, Cl. 250-563.000.

Lopez-Crevillen, Jose M., to General Motors Corporation. Sealing covers for air boxes. 4,527,710, Cl. 220-378.000.

Lopez Lopez, Julio, to Griplite, S.L. Soles for sport shoes. 4,527,345, Cl. 36-127.000.

Lord, Richard G., to Carrier Corporation. High-low superheat protection for a refrigeration system compressor. 4,527,399, Cl. 62-212.000.

Lorenz, Otto; and Rose, Gerd, to Bayer Aktiengesellschaft. Process for the preparation of aqueous dispersions of polyurethanes containing chemically fixed carboxylate and/or sulphonate groups. 4,528,323, Cl. 524-839.000.

Loso, Wendell R.: *See*—
Marx, Jon A.; and Loso, Wendell R., 4,527,391, Cl. 60-226.200.

Lotterbach, Gerhard: *See*—
Honig, Gunter; Kaiser, Gunther; Lotterbach, Gerhard; and Zucker, Udo, 4,527,422, Cl. 73-117.300.

Lotz, Horst K. Flame-cutting machine. 4,527,777, Cl. 266-50.000.

Lovinger, Gerald G.; and Whitehead, Susan A., to W. R. Grace & Co. Microorganism strains for the fermentative preparation of L-serine. 4,528,273, Cl. 435-116.000.

Low, Robert N.: *See—*
Cloutier, Frank L.; Low, Robert N.; McClelland, Paul H.; and Nielsen, Niels J., 4,528,577, Cl. 346-140.00R.

Lowe, Barrie M.: *See—*
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,528,171, Cl. 423-277.000.

LTV Aerospace and Defense: *See—*
Eden, Dayton D.; and Case, William E., 4,528,525, Cl. 332-7.510.

Lubke, Herbert; and Stascheit, Winfried, to Windmoller & Holscher. Apparatus for impression throw-on and throw-off and, for changing cylinders, and for causing a long stroke to be executed by an impression cylinder of a rotary gravure press. 4,527,474, Cl. 101-247.000.

Lubonsky, Fred E.: *See—*
Becker, Joseph J.; Lubonsky, Fred E.; Jacobs, Israel S.; and McCary, Richard O., 4,528,481, Cl. 315-248.000.

Lubrizol Corporation, The: *See—*
Grover, Kent B., 4,528,108, Cl. 252-75.000.

Lucas, Gary M.; and Dziark, John J., to General Electric Company. Adhesion promoters for one-component RTV silicone compositions. 4,528,353, Cl. 528-21.000.

Lucas, Gary M.: *See—*
Chung, Rack H.; Lucas, Gary M.; and Liermann, August O., 4,528,324, Cl. 524-863.000.

Lucas Industries: *See—*
Young, Donald A.; and Wilson, Ronald, 4,528,470, Cl. 310-78.000.

Lucas Industries Limited: *See—*
Meyer, Carl; and Madzgalla, Hans G., 4,527,669, Cl. 188-73.380.

Luke, John A., to Brown & Williamson Tobacco Corporation. Tobacco smoke filters. 4,527,572, Cl. 131-336.000.

Lund, Thore, to SKF Steel Engineering AB. Slip and wear resistant flooring and compositions and a method for producing same. 4,528,231, Cl. 428-148.000.

Lundy, David F.: *See—*
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., 4,528,035, Cl. 75-257.000.

Lutz, Eugene F., to Shell Oil Company. Ethylene oligomerization process carried out in a monohydric/dihydric alcohol solvent mixture. 4,528,416, Cl. 585-527.000.

Lutz, Peter L.; and Richard, Joseph D. Porous contraceptive device with an interstitial liquid. 4,527,988, Cl. 604-349.000.

Lytle, Daniel R.: *See—*
Smithbauer, Donald J.; Lytle, Daniel R.; and Helms, Clifford, 4,527,470, Cl. 101-111.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Difflipp, Kurt; and Ochs, Henrich, 4,527,478, Cl. 101-415.100.
Galster, Hans-Peter; and Despot, Janko, 4,527,477, Cl. 101-365.000.

MacBurney, Michael G.: *See—*
Irani, Keikhosrow; and MacBurney, Michael G., 4,527,896, Cl. 356-43.000.

MacCannell, Keith L.: *See—*
Lederis, Karl P.; MacCannell, Keith L.; and Rivier, Jean E. F., 4,528,189, Cl. 514-12.000.

Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, to Macedo, Pedro B.; and Litovitz, Theodore A. Immobilization of radwastes in glass containers and products formed thereby. 4,528,011, Cl. 65-30.130.

Machida, Bon: *See—*
Komatsuzaki, Nobuyuki; Tsubone, Masahiro; and Machida, Bon, 4,528,221, Cl. 428-35.000.

Machino, Katsuyuki: *See—*
Ise, Masahiro; Tanaka, Hidehiko; and Machino, Katsuyuki, 4,528,677, Cl. 375-36.000.

Mackenthun, Donald W.: *See—*
Burns, Gary D.; Mackenthun, Donald W.; and Schaber, Scott D., 4,528,665, Cl. 371-51.000.

Mackrill, Hubert W. Method for manufacturing rosettes. 4,527,719, Cl. 223-44.000.

MacNitt, Donald G., Jr.; and Fuss, Larry N., to United Technologies Corporation. Blade twisting apparatus. 4,527,410, Cl. 72-306.000.

Macpherson, Inc.: *See—*
Schwartzott, John M., 4,527,346, Cl. 38-144.000.

Mactron, Inc.: *See—*
Arndt, Raymond J., 4,527,510, Cl. 118-669.000.

Maddox, Edward L., to Leesona Corporation. Defective motor brush detector. 4,528,556, Cl. 340-648.000.

Madzgalla, Hans G.: *See—*
Meyer, Carl; and Madzgalla, Hans G., 4,527,669, Cl. 188-73.380.

Magar, Surendar S.: *See—*
McDonough, Kevin C.; and Magar, Surendar S., 4,528,625, Cl. 364-200.000.

Magis Farmaceutici S.R.L.: *See—*
Moroni, Adolfo, 4,528,393, Cl. 514-539.000.

Magnaflux Corporation: *See—*
Loose, Timothy C., 4,528,455, Cl. 250-563.000.

Magnuson, Linda M.: *See—*
Roxburg, Dwight W.; and Magnuson, Linda M., 4,527,559, Cl. 128-207.170.

Maida, Osamu, to Nippon Kogaku K.K. Display apparatus for automatic exposure control camera. 4,527,882, Cl. 354-442.000.

Mail-Ex Corporation: *See—*
Russell, Robert J., 4,527,378, Cl. 53-266.00A.

Maione, Claudio, to LA "GROG" S.r.l. Disposable device for self-heating or self-cooling of drinks or foodstuffs by an exothermic or endothermic reaction. 4,528,218, Cl. 428-35.000.

Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, to Societe de Recherches Industrielle S.O.R.I. Benzoyl-phenyl-piperidine derivatives. 4,528,294, Cl. 514-327.000.

Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, to UBE Industries, Ltd. Aromatic polyimide composite separating membrane. 4,528,004, Cl. 55-158.000.

Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; Inoue, Nobuhiro; and Saito, Setsuo, 4,527,380, Cl. 56-12.800.

Mako, John, to International Business Machines Corporation. Print hammer firing compensation circuit for printer velocity variation. 4,527,920, Cl. 400-146.000.

Maksay, Gabor: *See—*
Kardos, Julianna; Maksay, Gabor; and Simonyi, Miklos, 4,528,131, Cl. 260-112.00R.

Mallonen, Edward A.: *See—*
Forsell, Kenneth A.; and Mallonen, Edward A., 4,528,539, Cl. 337-49.000.

Manchak, Frank. Processing radioactive wastes and uranium mill tailings for safe ecologically-acceptable disposal. 4,528,129, Cl. 252-628.000.

Manfredi, John A. Portable dental kit. 4,527,574, Cl. 132-84.00B.

Mangold, Hans: *See—*
Klein, Walter; and Mangold, Hans, 4,528,597, Cl. 358-254.000.

Maniscalco, Jack E.; and Souto, Alberto. Vehicle rack for surfing board. 4,527,827, Cl. 296-3.000.

Mann, Harry F., to Sperry Corporation. Lateral flotation mechanism for combine harvesters. 4,527,381, Cl. 56-209.000.

Mannesmann Rexroth GmbH: *See—*
Eisenbacher, Egon; Cunningham, Sinclair; Wusthof, Peter; and Cunningham, Sinclair, 4,527,460, Cl. 91-491.000.

Mansfeld, Gerd: *See—*
Sturm, Wolfgang; Mansfeld, Gerd; and Reindl, Hans, 4,528,124, Cl. 252-522.00R.

Manville Service Corp.: *See—*
Corbin, Raymond L. R., 4,527,374, Cl. 52-557.000.

Mar, Henry M.; and Reider, Samuel B., to General Motors Corporation. Low loss duct burner. 4,527,390, Cl. 60-224.000.

Marach, David R., to Allied Corporation. Snap-in mounting device for electrical devices. 4,527,849, Cl. 339-59.00M.

March, Joseph E.; and Riley, Thomas E., to Platt Luggage, Inc. Carrying case with removable divider assembly. 4,527,677, Cl. 190-110.000.

Marconi Company, Limited, The: *See—*
Bowman, Roger; Peach, Robert C.; and Milverton, David R. J., 4,527,866, Cl. 350-358.000.
Woloszczuk, Edmund W., 4,528,568, Cl. 343-816.000.

Mariani, Renato: *See—*
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., 4,528,150, Cl. 264-36.000.

Mark Telephone Products, Inc.: *See—*
Dimeff, John; and Stewart, Clyde R., 4,527,419, Cl. 73-40.50A.

Markley, George L., to Ingersoll-Rand Company. Lubrication means for cyclically discharging lubricant into a fluid working chamber. 4,527,965, Cl. 418-88.000.

Markowski, Stanley J., to United Technologies Corporation. Diffuser for gas turbine engine. 4,527,386, Cl. 60-39.360.

Marks, Rex B.: *See—*
Gill, Dee R.; and Marks, Rex B., 4,528,060, Cl. 156-432.000.

Marney, O. Guy, Jr.; and McKinley, Henry J., Jr., to Standard Oil Company. Portable thermally insulated case. 4,528,439, Cl. 219-386.000.

Martin, Eugene G.; and Risser, Dale M., to FoodCraft Equipment Company, Inc. Tendon cutter. 4,527,305, Cl. 17-11.300.

Martin, James L., to Caterpillar Tractor Co. Modular unit fluid pump-injector. 4,527,738, Cl. 239-90.000.

Martin, John R.: *See—*
Block, Robert S.; and Martin, John R., 4,528,589, Cl. 358-122.000.

Martin, Mae E. F.: *See—*
John, William W.; Pilgram, Kurt H.; and Martin, Mae E. F., 4,528,027, Cl. 71-93.000.

Martin Marietta Corporation: *See—*
Tobey, William H.; Coyner, John V.; and Gardner, William J., 4,527,362, Cl. 52-71.000.

Martin, Robert J., III, to General Electric Company. Arrangement for providing signalling tones and volume control signals. 4,528,696, Cl. 455-73.000.

Martin, Thomas E. Duplicating attachment for lathe. 4,527,602, Cl. 142-55.000.

Martinelli, Edoardo: *See—*
Fontanella, Luigi; Martinelli, Edoardo; and Assandri, Alessandro, 4,528,297, Cl. 514-392.000.

Martinez Vera, Enrique R.; and Becerra-Novoa, Jorge O., to Hylsa, S.A. Method of reducing iron ore. 4,528,030, Cl. 75-35.000.

Martinich, Steven J.: *See—*
Juodikis, Peter; and Martinich, Steven J., 4,528,635, Cl. 364-501.000.

Marton, Janet L.: *See—*
Goodwin, Anton E.; Marton, Janet L.; Owens, Robert M.; Whisenhunt, Jackie W.; and Swain, Roy D., 4,528,162, Cl. 422-101.000.

Maruko, Saburo: *See—*
Yamaguchi, Masanori; Tsutsumi, Yasuyuki; Nogita, Shunsuke; Shimada, Kazunari; and Maruko, Saburo, 4,528,251, Cl. 429-25.000.

Maruska, H. Paul: *See*—
Moustakas, Theodore D.; and Maruska, H. Paul, 4,528,082, Cl. 204-192.00S.

Maruyama, Kenji; and Sazaki, Konin, to Ryobi Limited. Fishing spinning reel. 4,527,752, Cl. 242-84.20G.

Marx, Jon A.; and Loso, Wendell R., to United Technologies Corporation. Thrust reverser. 4,527,391, Cl. 60-226.200.

Marx, Rainer: *See*—
Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, 4,528,573, Cl. 346-108.000.

Marz, Kurt: *See*—
Hollweck, Walter; Marz, Kurt, and Eschenbacher, Herbert, 4,528,541, Cl. 337-354.000.

Masafumi, Yamanouchi: *See*—
Shigehiro, Koga; Yoshihisa, Kanazawa; Takeshi, Okamoto; Masafumi, Yamanouchi; and Kazumichi, Shudo, 4,528,306, Cl. 523-219.000.

Masaki, Mitsuo, to Nippon Chemiphar Co., Ltd. 2-(4-Diphenylmethylpiperazinyl)-1-phenyl alkanol or their salts, a process for their production and a cerebral circulation-improving drug. 4,528,194, Cl. 514-255.000.

Maschinenfabrik Sulzer-Ruti AG: *See*—
Kagi, Bruno, 4,527,596, Cl. 139-1.00C.

Mashiko, Kazuyuki: *See*—
Sasaki, Akira; Mashiko, Kazuyuki; Saitoh, Shouji; and Hakoyama, Akiyoshi, 4,528,572, Cl. 346-76.0PH.

Masreliez, Carl J. Medical or dental probe with self-heating tip and methods for making. 4,527,560, Cl. 128-303.100.

Mastrodicasa, Arthur R. Display fixture. 4,527,697, Cl. 211-189.000.

Masuda, Itsuro, to Hamada Printing Press Mfg. Co., Ltd. Printer-slotter with speed variable motor control. 4,527,788, Cl. 270-21.100.

Masui, Takatoshi: *See*—
Suzuki, Makoto; Takimoto, Toshiyuki; Yoshioka, Mamoru; and Masui, Takatoshi, 4,527,529, Cl. 123-478.000.

Masumoto, Tsuyoshi; Inoue, Akihisa; Hagiwara, Michiaki; and Yasuhara, Kiyomi, to Unitika Ltd.; and Tsuyoshi Masumoto. Amorphous Co-based metal filaments and process for production of the same. 4,527,614, Cl. 164-463.000.

Mathews, George P., to Eaton Corporation. Torque limiting coil clutch and automatic slack adjuster utilizing same. 4,527,683, Cl. 192-111.00A.

Matsuda, Tadashi; Mizuno, Tsuneo; and Takada, Noboru, to Fujitsu Limited. Ink jet printing head. 4,528,575, Cl. 346-140.00R.

Matsuki, Kensei: *See*—
Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kensei, 4,528,045, Cl. 148-35.000.

Matsumoto, Koji: *See*—
Sakai, Takayoshi; Sano, Shinji; and Matsumoto, Koji, 4,528,633, Cl. 364-474.000.

Matsumoto, Yukio: *See*—
Hayashi, Osamu; Kurihara, Hideo; and Matsumoto, Yukio, 4,528,340, Cl. 525-379.000.

Matsunaga, Tadashi, to Kabushiki Kaisya Advance Kaihatsu Kenkyujo. Electrochemical method for detection and classification of microbial cell. 4,528,270, Cl. 435-39.000.

Matsuo, Yoshiho; Nishijima, Ryoji; Yoshino, Atsuhiko; and Kawashima, Takai, to Nissan Chemical Industries, Ltd.; and Nissan Maruzen Polyethylene Company. Process for producing a blow molding resin. 4,528,151, Cl. 264-83.000.

Matsuoka, Isamu: *See*—
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, 4,527,507, Cl. 118-314.000.

Matsuoka, Yoshio: *See*—
Ai, Hideo; Ikeda, Akihiko; and Matsuoka, Yoshio, 4,528,332, Cl. 525-332.200.

Matsushita, Yasuo; Nakamura, Kousuke; and Kosugi, Tetuo, to Hitachi, Ltd. Electroconductive ceramics. 4,528,121, Cl. 252-516.000.

Matsuura, Takashi, to Nippon Electric Co., Ltd. FM Transceiver frequency synthesizer. 4,528,522, Cl. 331-2.000.

Matthews, William G.; and Whitaker, Todd E., to United States of America, Navy. Interferometric fiber optic hydrophone winding machine. 4,527,749, Cl. 242-7.150.

Mattson, Richard W., to Allied Corporation. Control apparatus for variable speed reversible motor. 4,528,544, Cl. 338-78.000.

Mauer, Albert: *See*—
Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, 4,528,099, Cl. 210-489.000.

Mauermann, Walter; and Dudeck, Ingo, to Daimler-Benz Aktiengesellschaft. Control method and apparatus for combating knocking in internal combustion engines. 4,527,525, Cl. 123-425.000.

Mauger, David W.; Lawrie, James W.; McCarthy, John T.; and Tozzi, Michael A., to Clevepak Corporation. Apparatus for processing box partitions. 4,527,376, Cl. 53-113.000.

Mauldin, Herbert N. Paver steering apparatus. 4,527,649, Cl. 180-6.480.

Maurer, Edgar A.; and Essex, John D., to Hoover Company, The. Canister cleaner. 4,527,302, Cl. 15-325.000.

Maxfield, MacRae: *See*—
Wolf, James F.; Savner, Suzanne M.; Maxfield, MacRae; and Shacklette, Lawrence W., 4,528,254, Cl. 429-197.000.

Mayer, Jeffrey C.: *See*—
Lastrina, Frank A.; Pommer, Leslie M.; and Mayer, Jeffrey C., 4,527,387, Cl. 60-39.092.

Maytag Company, The: *See*—
Bales, Michael E.; and Schmidt, Wallace E., 4,527,542, Cl. 126-299.00D.

Mazda Motor Corporation: *See*—
Sakurai, Shigeru; Oda, Hiroyuki; Satow, Haruhiko; and Okimoto, Haruo, 4,527,534, Cl. 123-559.000.

McBiles, Carol D., to Motorola, Inc. PSK modulator with noncollapsable output for use with a PLL power amplifier. 4,528,526, Cl. 332-16.00R.

McCaffrey, David J. A.; and Sheppard, John P., to Coal Industry (Patents) Limited. Froth flotation. 4,528,107, Cl. 252-61.000.

McCarthy, John T.: *See*—
Mauger, David W.; Lawrie, James W.; McCarthy, John T.; and Tozzi, Michael A., 4,527,376, Cl. 53-113.000.

McCary, Richard O.: *See*—
Becker, Joseph J.; Luborsky, Fred E.; Jacobs, Israel S.; and McCary, Richard O., 4,528,481, Cl. 315-248.000.

McClelland, Paul H.: *See*—
Cloutier, Frank L.; Low, Robert N.; McClelland, Paul H.; and Nielsen, Niels J., 4,528,577, Cl. 346-140.00R.

McCormick, Edward J., to Raymond Corporation, The. Load handling method and apparatus. 4,527,943, Cl. 414-666.000.

McDaniel, Max P.; and Johnson, Marvin M. Polymerization process using chromium catalyst on mixed metal phosphate with organoboron cocatalysts. 4,528,338, Cl. 526-113.000.

McDonough, Kevin C.; and Magar, Surendar S., to Texas Instruments Incorporated. Input/output instruction execution in microcomputer. 4,528,625, Cl. 364-200.000.

McDougal, John R. Process and composition for the manufacture of products from silicone rubber. 4,528,354, Cl. 528-33.000.

McDougall, Gloria, to Sentrachem Limited. Recovery of gold and/or silver from cyanide leach liquors on activated carbon. 4,528,166, Cl. 423-23.000.

McFadden, James R., to General Motors Corporation. Crossbeam support pad for towable vehicle. 4,527,812, Cl. 280-402.000.

McGill Incorporated: *See*—
McGill, James C.; Alley, James R.; and Coombs, David W., 4,528,000, Cl. 55-2.00G.

McGill, James C.; Alley, James R.; and Coombs, David W., to McGill Incorporated. Fuel conditioning process. 4,528,000, Cl. 55-2.00G.

McGill, John, to Energy Conversion Devices, Inc. Photoresponsive semiconductor device having a double layer anti-reflective coating. 4,528,418, Cl. 136-256.000.

McGraw-Edison Company: *See*—
Juve, Robert J., 4,527,508, Cl. 118-425.000.

McGuinness, James A.: *See*—
Blem, Allen R.; and McGuinness, James A., 4,528,022, Cl. 71-73.000.

McKee, Kenneth E.; Meitl, Harold G.; Thanh, Vo V.; and Bixler, Craig A., to J. I. Case Company. Tilt-telescope steering wheel arrangement. 4,527,444, Cl. 74-493.000.

McKinley, Henry J., Jr.: *See*—
Marney, O. Guy, Jr.; and McKinley, Henry J., Jr., 4,528,439, Cl. 219-386.000.

McLaughlin, Stephen J.; Harville, John D.; and Blair, Gary S. Mounting assembly for a shaft. 4,527,914, Cl. 384-428.000.

McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., to Pump Engineer Associates, Inc. Methods and apparatus for recovery of hydrocarbons from underground water tables. 4,527,633, Cl. 166-370.000.

McLean, John W.; and Gasser, Oswald, to ESPE, Fabrik pharmazeutischer Praparate GmbH. Powdered dental material and process for the preparation thereof. 4,527,979, Cl. 433-228.000.

McMains, Kevin W.; and Wilkerson, Larry A., to American Seating Company. Seating apparatus with removable reclinable back assemblies. 4,527,832, Cl. 297-355.000.

McManis, George E., III; Miles, Melvin H.; and Fletcher, Aaron N., to United States of America, Navy. High performance molten nitrate cell. 4,528,253, Cl. 429-112.000.

McNeilab, Inc.: *See*—
Mills, John E., 4,528,382, Cl. 548-561.000.
Scott, Maicolm K., 4,528,293, Cl. 514-323.000.

Mead Corporation, The: *See*—
Sweet, George W., 4,528,571, Cl. 346-75.000.

Meadows, George E.: *See*—
Keough, Robert F.; and Meadows, George E., 4,528,032, Cl. 75-66.000.

Mechanical Technology Incorporated: *See*—
Wilcock, Donald F.; and Gray, Stanley, 4,527,802, Cl. 277-1.000.

Medbery, John L., to International Minerals & Chemical Corp. Granulated fertilizer and slurry process therefor. 4,528,021, Cl. 71-41.000.

Meehan, Patrick J., to Du Pont de Nemours, E. I., and Company. Fluid sample cell for X-ray analysis. 4,528,657, Cl. 378-47.000.

Megcadiamond Industries Inc.: *See*—
Horton, M. Duane; and Horton, L. Brent, 4,527,643, Cl. 175-329.000.

Mehkri, Shahab A.: *See*—
Shariff, Sadiq A.; Bharteey, Brij M.; and Mehkri, Shahab A., 4,528,614, Cl. 361-379.000.

Mehta, Pradip S.; and Valsamis, Lefteris N., to USM Corporation. Rotary processors and seals. 4,527,900, Cl. 366-99.000.

Meier zu Koecker, Heinz; Walter, Robert; and Schmidt, Torsten, to Kali-Chemie Aktiengesellschaft. Waste gas treatment processes. 4,528,170, Cl. 423-245.000.

Mein, Gordon F.; Terry, John B.; and Hicks, Gregory F., to Northern Telecom Limited. Echo cancellation circuit using stored, derived error map. 4,528,676, Cl. 375-14.000.

Meitl, Harold G.: *See*—
McKee, Kenneth E.; Meitl, Harold G.; Thanh, Vo V.; and Bixler, Craig A., 4,527,444, Cl. 74-493.000.

Melindo, Flavio; and Sartori, Mario, to Cselt-Centro Studi E Laboratori Telecommunicazioni S.p.A. Method of and circuitry for detecting, at a telephone exchange, the lifting of a subscriber's handset in response to ringing current emitted by the exchange. 4,528,425, Cl. 179-18.0HB.

Meline, Harry R., to MTS Systems Corporation. Averaging axial-diametral strain measuring extensometer. 4,527,335, Cl. 33-147.00D.

Meline, Harry R., to MTS Systems Corporation. Waterproof strain gage element system. 4,528,542, Cl. 338-2.000.

Melling, Hugh: *See*—
Chow, Hector; and Melling, Hugh, 4,527,724, Cl. 227-8.000.

Membrino, Hercules. Box dispenser for pad of plastic bags. 4,527,693, Cl. 206-554.000.

Mericle, Robert W., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips. 4,527,562, Cl. 128-325.000.

Merkling, Robert M., Jr.; and Stanasolovich, David, to International Business Machines Corporation. Selective anisotropic reactive ion etching process for polysilicide composite structures. 4,528,066, Cl. 156-643.000.

Merlo, Joseph C. Control of energy to fluorescent lighting. 4,528,482, Cl. 315-291.000.

Merola, Joseph S.: *See*—
Oswald, Alexis A.; Merola, Joseph S.; Reisch, John C.; and Kastrup, Rodney V., 4,528,404, Cl. 568-454.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Fanslau, Udo; and Grosche, Norbert, 4,527,829, Cl. 297-17.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mbH: *See*—
Heinze, Frank; and Richter, Heinz, 4,528,051, Cl. 156-92.000.
Trier, Ferdinand, 4,527,951, Cl. 416-145.000.

Metro Materials Corporation: *See*—
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., 4,528,035, Cl. 75-257.000.

Metzger, Donald L.: *See*—
Hughes, Donald W. K.; Metzger, Donald L.; and Reynolds, Charles E., 4,527,857, Cl. 339-258.00S.

Meyer, Carl; and Madzgalla, Hans G., to Lucas Industries Limited. Friction pad assemblies for use in disc brakes. 4,527,669, Cl. 188-73.380.

Meyer, Herbert J.: *See*—
Howlett, Donald L.; Meyer, Herbert J.; and Zimmer, Stanley F., 4,528,650, Cl. 367-79.000.

Meyer, Russell L.: *See*—
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,528,504, Cl. 324-158.00F.

Meyers, Jonathan H. Method and apparatus for mounting clips. 4,527,689, Cl. 206-342.000.

Meyers, Roger A. Infant seat and table and supply carrier. 4,527,830, Cl. 297-192.000.

Mezger, Hans; Konneker, Reinhard; and Kelm, Joachim, to Harley-Davidson Motor Co., Inc. Water pump for reciprocating piston internal combustion engine. 4,527,517, Cl. 123-41.470.

Michelsen Peckaging Company: *See*—
Clevenger, David M., 4,528,228, Cl. 428-74.000.

Michigan Technological University, Board of Control of: *See*—
Goksel, Mehmet A., 4,528,029, Cl. 75-3.000.

Michnowski, Jane: *See*—
Wang, Martha Y.; Michnowski, Jane; Hnat, Diane L.; and Ross, Robert E., 4,528,202, Cl. 426-550.000.

Micro Pure Systems, Inc.: *See*—
Foote, Kenneth G., 4,527,420, Cl. 73-61.00R.

Micron S.A.L.: *See*—
Umbert, Juan, 4,527,809, Cl. 279-64.000.

Middlehurst, Richard J.: *See*—
Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., 4,527,848, Cl. 339-17.00M.

Middleton, Francisco A.; Das, Santanu; and Hargrave, Franklin, to International Telephone and Telegraph Corporation. Multiparty line adapter with privacy feature controlled by reversal of line polarity at a central power source. 4,528,424, Cl. 179-17.00A.

Middleton, Jerry L.; and Bienick, Richard H., to Chrysler Corporation. Fuel tank inlet restrictor. 4,527,601, Cl. 141-348.000.

Midis S.a.s. di Francesco Bartolomucci: *See*—
Parma, Giovanni; and Bartolomucci, Francesco, 4,527,739, Cl. 239-186.000.

Midland-Ross Coporation: *See*—
Hoetzl, Max, 4,527,506, Cl. 118-63.000.

Mifune, Hiroyuki: *See*—
Ishiguro, Shoji; Mifune, Hiroyuki; Fuseya, Yoshiharu; and Kojima, Tetsuro, 4,528,264, Cl. 430-609.000.

Mihara, Shinichi, to Olympus Optical Co., Ltd. Large-aperture ratio telephoto lens system. 4,527,868, Cl. 350-454.000.

Mikron Instrument Company, Inc.: *See*—
Irani, Keikhosrow; and MacBurney, Michael G., 4,527,896, Cl. 356-43.000.

Miles, Anthony: *See*—
Crick, Neil; and Miles, Anthony, 4,528,602, Cl. 360-66.000.

Miles, Melvin H.: *See*—
McManis, George E., III; Miles, Melvin H.; and Fletcher, Aaron N., 4,528,253, Cl. 429-112.000.

Miles, Thomas P.; and Koenen, Richard A., to Argo Systems, Inc. Radio signal receiving system. 4,528,567, Cl. 343-442.000.

Miller, Allan S., to Hiross International Corp., S.A. Automatic condensation discharger. 4,527,584, Cl. 137-192.000.

Miller, Arthur F.: *See*—
Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., 4,528,398, Cl. 562-534.000.

Miller Brewing Company: *See*—
Mizerak, Robert J.; Bertkau, Geoffrey H.; Line, William F.; and Chicoye, Etzer, 4,528,198, Cl. 426-16.000.

Miller, David A. B.: *See*—
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,528,464, Cl. 307-425.000.

Miller, Edward B.: *See*—
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., 4,528,035, Cl. 75-257.000.

Miller, Gert; Diers, Franz; and Hermanns, Hans-Josef, to Scheidt & Bachmann GmbH. Device for automatic cashiers for storing coins. 4,527,577, Cl. 133-3.00H.

Miller, Robert W. Flight simulating video game. 4,527,980, Cl. 434-55.000.

Miller, Theodore E., Jr., to Dow Chemical Company, The. Dynamic surface tensiometry and method. 4,527,421, Cl. 73-64.400.

Mills, David, to Rolls-Royce Limited. Surface oxide layer treatment. 4,528,043, Cl. 148-13.100.

Mills, Elden H.: *See*—
Abbott, Vaughan; Beckwith, Bruce R.; Kingsbury, Charles M.; Mungovan, John P.; and Mills, Elden H., 4,528,017, Cl. 65-240.000.

Mills, John E., to McNeilab, Inc. Imidoyl substituted pyrroles. 4,528,382, Cl. 548-561.000.

Mills, Sherry J.: *See*—
Riggins, Oral L.; Mills, Sherry J.; Warkentin, John H.; Stephans, Joseph P.; and Wisdom, Clancy O., 4,528,433, Cl. 200-150.00C.

Milverton, David R. J.: *See*—
Bowman, Roger; Peach, Robert C.; and Milverton, David R. J., 4,527,866, Cl. 350-358.000.

Minezaki, Shigehiro: *See*—
Ishii, Yutaka; Minezaki, Shigehiro; Kozaki, Shuichi; and Funada, Fumiaki, 4,528,115, Cl. 252-299.630.

Minigrip, Inc.: *See*—
Ausnit, Steven, 4,528,224, Cl. 428-36.000.

Minnesota Mining and Manufacturing Company: *See*—
Assell, Robert L.; and Skwor, Edward P., 4,527,726, Cl. 227-19.000.
Bingham, Wallace K., 4,527,383, Cl. 57-200.000.
Foslien, Floyd L., 4,527,725, Cl. 227-19.000.
Janssen, Edward W., 4,528,059, Cl. 156-307.300.
Ofstead, Ronald F., 4,528,325, Cl. 525-60.000.
Rood, Robert M.; and Wulfing, James J., 4,527,755, Cl. 242-199.000.
Sweeny, Norman P., 4,528,226, Cl. 428-40.000.

Minolta Camera Kabushiki Kaisha: *See*—
Tanaka, Harumi; and Iwata, Takashi, 4,527,876, Cl. 354-229.000.

Mintz, Leon: *See*—
Block, Charles; and Mintz, Leon, 4,527,491, Cl. 112-104.000.

Mira, Silvio: *See*—
Goede, Simon; Hauser, Peter; and Mira, Silvio, 4,527,894, Cl. 356-28.000.

Mirabile, Paul J. Automatic beverage tube cleaner. 4,527,585, Cl. 137-240.000.

Miracle Metals, Inc.: *See*—
Badger, Philip O., 4,528,079, Cl. 204-129.100.

Miszkiewicz, Henry L.: *See*—
Willmore, James A.; and Miszkiewicz, Henry L., 4,528,445, Cl. 235-469.000.

Mitsubishi Chemical Industries Limited: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
Tano, Kazuo; Sato, Keiichi; and Okoshi, Toru, 4,528,403, Cl. 568-454.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Akasu, Masahira, 4,527,526, Cl. 123-425.000.
Kishida, Mitsuhiro, 4,528,421, Cl. 174-143.000.
Nomura, Masami, 4,527,663, Cl. 187-29.00R.
Ogawa, Hitoshi, 4,527,968, Cl. 418-173.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hayashi, Masayuki; and Suzuki, Masatoshi, 4,527,377, Cl. 53-167.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Shibatani, Haruo; Takahashi, Kunimasa; and Kameda, Takashi, 4,528,087, Cl. 208-22.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,528,330, Cl. 525-85.000.

Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, to Zenyaku Kogyo Kabushiki Kaisha. Polysaccharide PS-A obtained from barrenwort deriving from plants belonging to the genus Epimedium, process for preparation thereof and phylactic and immunostimulating agents comprising said polysaccharide PS-A effective component. 4,528,188, Cl. 424-116.000.

Mitsui, Hisami: *See*—
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.

Mitsui, Osamu; and Fukuoka, Yohei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of cyclic alcohol. 4,528,409, Cl. 568-835.000.

Mitsui, Takao; Sasaya, Hideaki; and Inagaki, Mitsuo, to Nippon Soken, Inc. Scroll-type pump. 4,527,964, Cl. 418-55.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Mizuno, Ichiro; and Sugizaki, Iwao, 4,527,336, Cl. 33-172.00R.

Mitzusawa, Nobutoshi: *See*—
Koumura, Noboru; Mitzusawa, Nobutoshi; and Ozawa, Kunitaka, 4,528,576, Cl. 346-140.00R.

Miura, Ishi: *See*—
Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, 4,528,034, Cl. 75-255.000.

Miyabara, Ayako: *See*—
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.

Miyadera, Yasuo: *See*—
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.

Miyagawa, Kiyotaka: *See*—
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.

Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, to Nissin Machine Works, Limited. Method for producing a grinding wheel by electroplating. 4,528,074, Cl. 204-16.000.

Miyazaki, Jun: *See*—
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; Miyazaki, Jun; Fujimoto, Takahiko; and Nakata, Hitoshi, 4,527,615, Cl. 164-468.000.

Miyazaki, Takaaki: *See*—
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.

Miyazawa, Shintaro; Nanishi, Yasushi; Tada, Kohji; Kawasaki, Akihisa; and Kotani, Toshihiro, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. Process for manufacturing boron-doped gallium arsenide single crystal. 4,528,061, Cl. 156-605.000.

Miyoshi, Shuji; Sugihara, Takashi; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Moisture sensitive resistive element. 4,528,543, Cl. 338-35.000.

Miyoshi, Takahito; Fujiyama, Masaaki; and Okutu, Toshimitu, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,528,240, Cl. 428-323.000.

Mizerak, Robert J.; Bertkau, Geoffrey H.; Line, William F.; and Chicoye, Etzer, to Miller Brewing Company. Preparation of low calorie beer with malt extract free of yeast lethal factors. 4,528,198, Cl. 426-16.000.

Mizuhara, Howard, to GTE Products Corporation. Strip of nickel-iron brazing alloys containing carbon and process. 4,528,247, Cl. 428-606.000.

Mizukoshi, Hiroshi: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,528,330, Cl. 525-85.000.

Mizuno, Ichiro; and Sugizaki, Iwao, to Mitutoyo Mfg. Co., Ltd. Displacement measuring instrument. 4,527,336, Cl. 33-172.00R.

Mizuno, Tsuneo: *See*—
Matsuda, Tadashi; Mizuno, Tsuneo; and Takada, Noboru, 4,528,575, Cl. 346-140.00R.

Mizuta, Masaji: *See*—
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,527,878, Cl. 354-298.000.

Mizutani, Shigemitsu: *See*—
Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, 4,528,085, Cl. 204-416.000.

Mobil Oil Corporation: *See*—
Frick, John P., 4,527,815, Cl. 285-55.000.
Grosz, Edward G.; and Herrington, F. John, 4,527,751, Cl. 242-75.510.
Schmitt, Kirk D., 4,528,383, Cl. 549-78.000.
Tsui, Tien-Fung, 4,528,090, Cl. 209-2.000.
Uhri, Duane C., 4,527,836, Cl. 299-17.000.

Mobirolo S.p.A.: *See*—
Morellini, Franco, 4,527,367, Cl. 52-187.000.

Modesitt, Phillip C.: *See*—
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,527,633, Cl. 166-370.000.

Modic, Frank J., to General Electric Company. Transparent membrane structures. 4,528,314, Cl. 524-407.000.

Modulite Corporation: *See*—
Weber, Franz K., 4,528,620, Cl. 362-86.000.

Moe, Walter: *See*—
Jones, Lawrence T.; Lee, R. Stephen; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,527,688, Cl. 206-315.100.

Moeller, Dennis L.: *See*—
Dean, Mark E.; and Moeller, Dennis L., 4,528,626, Cl. 364-200.000.

Mohrholz, Kurt: *See*—
Dorner, Karlheinz; and Mohrholz, Kurt, 4,527,759, Cl. 248-73.000.

Mohrmann, Karl H.: *See*—
Colln, Reimer; and Mohrmann, Karl H., 4,528,379, Cl. 546-209.000.

Molbaek, Jens J.: *See*—
Jorgensen, Peter; Molbaek, Jens J.; Spies, Volker; Dyhr-Mikkelsen, Poul C.; and Dam, Poul S., 4,527,595, Cl. 138-43.000.

Molex Incorporated: *See*—
Dechelette, Helen, 4,527,852, Cl. 339-97.00P.
Dechelette, Helen, 4,527,853, Cl. 339-97.00R.

Molins plc: *See*—
Arther, Hugh M.; Preston, Edward G.; Stewart, David B.; and Wood, Godfrey A., 4,528,050, Cl. 156-62.400.

Moller, Hinrich; and Wallat, Siegfried, to Henkel Kommanditgesellschaft (KGaA). Method of using certain aryl-mercapto-lower-alkanamides as antiseborrheic agents. 4,528,286, Cl. 514-232.000.

Molloy, Bryan B.; and Steinberg, Mitchell I., to Eli Lilly and Company. Imaging agents and method. 4,528,177, Cl. 424-1.100.

Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, to Bayer Aktiengesellschaft. Process for preparing granules of water-insoluble solids. 4,527,746, Cl. 241-23.000.

Mongeon, Robert J.: *See*—
Wayne, Robert J.; Henschke, Robert W.; and Mongeon, Robert J., 4,528,668, Cl. 372-26.000.

Monsanto Company: *See*—
Wrobleski, James T., 4,528,280, Cl. 502-209.000.

Montagu, Jean I., to General Scanning, Inc. Actuator with compensating flux path. 4,528,533, Cl. 335-230.000.

Moody, Roy A.; Kirsinas, Peter; and Turek, James A., to Panduit Corp. Portable mass termination tool. 4,527,328, Cl. 29-749.000.

Moon, Nancy J.; Ely, Lane O.; and Sudweeks, E. M., to University of Georgia Research Foundation, Inc. Silage production from fermentable forages. 4,528,199, Cl. 426-53.000.

Moore, Bernard S.: *See*—
Cue, Berkeley W., Jr.; and Moore, Bernard S., 4,528,387, Cl. 549-404.000.

Moore Business Forms, Inc.: *See*—
Stahl, Torbjorn; Hektoen, Per; and Karlsen, Oystein, 4,528,054, Cl. 156-226.000.

Moore, Robert D.: *See*—
Burke, Dennis J.; and Moore, Robert D., 4,528,101, Cl. 210-656.000.

Morais, Douglas H., to Harris Corporation. Radio communication system using frequency division multiplexing for transmission between a master station and a plurality of remote stations. 4,528,656, Cl. 370-30.000.

Morawek, Robert: *See*—
Treyssac, Georges M.; and Morawek, Robert, 4,528,098, Cl. 210-414.000.

Morax, Francois, to DELTA-REAL Establishment. Device for opening envelopes or the like. 4,527,455, Cl. 83-588.000.

Morellini, Franco, to Mobirolo S.p.A. Spiral staircase. 4,527,367, Cl. 52-187.000.

Morgan Construction Company: *See*—
Jalil, Asjed A., 4,527,408, Cl. 72-201.000.

Morgan, John W., II; and Klein, Thomas E., to Bloom Engineering Company, Inc. Weld insert and refractory anchor. 4,528,672, Cl. 373-75.000.

Mori, Kei. Sunbeam concentrating and collecting apparatus. 4,527,859, Cl. 350-252.000.

Mori, Shigeo: *See*—
Fujita, Takeshi; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,528,360, Cl. 528-297.000.

Mori, Takasuke: *See*—
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; Miyazaki, Jun; Fujimoto, Takahiko; and Nakata, Hitoshi, 4,527,615, Cl. 164-468.000.

Moriyama, Masakazu; and Saito, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Travel locus display device. 4,528,552, Cl. 340-525.000.

Moriyama, Masaru; and Sasamura, Kohei, to Victor Company of Japan, Ltd. Digital signal reproducing apparatus. 4,528,601, Cl. 360-46.000.

Moroni, Adolfo, to Magis Farmaceutici S.R.L. Derivatives having expectorant activity, the procedure for their preparation and the pharmaceutical compositions which contain them. 4,528,393, Cl. 514-539.000.

Morris, Nicholas G.: *See*—
Abbott, Vaughan; Morris, Nicholas G.; Lambert, Scott M.; and Letellier, Richard A., 4,528,015, Cl. 65-162.000.

Morton, Anthony J.; Harvey, Kenneth; and Hayes, Harry, to Colgate-Palmolive Company. Dentifrice containing dual sources of fluoride. 4,528,181, Cl. 424-52.000.

Motier, John, to Atlantic Richfield Company. Compositions for and method of reducing hydrocarbon fluid friction loss in conduits. 4,527,581, Cl. 137-13.000.

Motorola, Inc.: *See*—
Dressler, Roger W., 4,528,686, Cl. 381-28.000.
Fraser, Robert J., 4,528,698, Cl. 455-319.000.
McBiles, Carol D., 4,528,526, Cl. 332-16.00R.
Peterson, Joe W., 4,528,505, Cl. 324-158.00R.
Sturm, James E.; and Peterson, Colleen S., 4,527,330, Cl. 29-827.000.

Moulton, Lee A. Electro pneumatic bed. 4,527,298, Cl. 5-66.000.

Mourray, Jack W., to Ford Motor Company. Shock absorber with a hydro-mechanical stop. 4,527,674, Cl. 188-284.000.

Moustakas, Theodore D.; and Maruska, H. Paul, to Exxon Research and Engineering Co. Method for sputtering a PIN amorphous silicon

semi-conductor device having partially crystallized P and N-layers. 4,528,082, Cl. 204-192.00S.
Mozena, John D. Cleated shoes. 4,527,344, Cl. 36-126.000.
Msarsa, Johnnie. Small animal protective garment. 4,527,991, Cl. 604-399.000.
MTA Kozponti Kemiai Kutato Intezet: *See*—
Kardos, Julianna; Maksay, Gabor; and Simonyi, Miklos, 4,528,131, Cl. 260-112.00R.
MTS Systems Corporation: *See*—
Haeg, Steven R.; and LaCroix, Michael G., 4,527,416, Cl. 73-11.000.
Meline, Harry R., 4,527,335, Cl. 33-147.00D.
Meline, Harry R., 4,528,542, Cl. 338-2.000.
Mugglestone, Peter; and Cline, John, to Thomson Industries, Inc. Linear bearing. 4,527,840, Cl. 308-6.00C.
Mukoh, Akio: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
Mullane, William E.: *See*—
Challenger, Richard; and Mullane, William E., 4,528,057, Cl. 156-273.700.
Muller, Peter: *See*—
Arend, Gunter; Konigshofen, Heinrich; Muller, Peter; and Musch, Rudiger, 4,528,388, Cl. 549-448.000.
Muller, Rolf, to Papst Motoren GmbH & Co. Kg. Multiple-shaft drive. 4,528,483, Cl. 318-112.000.
Muller, Rudolf; and Stolberg, Hermann J., to Hermann Rappold & Co. GbmH. Shut-off valve with a seal formed from an elastic strip. 4,527,773, Cl. 251-306.000.
Mungovan, John P.: *See*—
Abbott, Vaughan; Beckwith, Bruce R.; Kingsbury, Charles M.; Mungovan, John P.; and Mills, Elden H., 4,528,017, Cl. 65-240.000.
Muraki, Yu: *See*—
Namba, Kazuya; Yano, Kazuya; Nakazima, Hirosi; and Muraki, Yu, 4,527,699, Cl. 215-1.00C.
Murali, Beegamudre N.; Rosenberg, Jeffrey S.; and Cole, Clinton W., to Halliburton Company. Pumping apparatus. 4,527,954, Cl. 417-46.000.
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, to Agency of Industrial Science and Technology. Highly electroconductive conjugated polymer composition and process for producing the same. 4,528,118, Cl. 252-500.000.
Murase, Makoto; and Usuki, Arimitsu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. N-type polyacetylene and a process for producing the same. 4,528,122, Cl. 252-518.000.
Murase, Takao: *See*—
Kato, Nobuhide; and Murase, Takao, 4,528,086, Cl. 204-427.000.
Murata, Kazushige: *See*—
Aoyama, Fumihiko; Murata, Kazushige; and Hayashi, Masahiro, 4,528,152, Cl. 264-87.000.
Murata Kikai Kabushiki Kaisha: *See*—
Yoshida, Kaichiro; and Ueda, Yutaka, 4,527,597, Cl. 139-68.000.
Murata Manufacturing Co., Ltd.: *See*—
Tamura, Sadahiro; and Nishikawa, Toshio, 4,528,655, Cl. 369-126.000.
Murdoch, George, to Avon Murdoch Limited. Bed pan and urine bottle washing and disinfecting machines. 4,527,843, Cl. 312-31.200.
Murley, Jackie D., to Co-Exx Pipe Company, Inc. Apparatus for injection molding polymeric articles. 4,527,970, Cl. 425-404.000.
Murphy, Joanne. Jewelry chain-stay. 4,527,316, Cl. 24-616.000.
Musch, Rudiger: *See*—
Arend, Gunter; Konigshofen, Heinrich; Muller, Peter; and Musch, Rudiger, 4,528,388, Cl. 549-448.000.
Muse, Joel, Jr.: *See*—
Colvin, Howard A.; Fiedler, Ronald D.; Muse, Joel, Jr.; and Smith, Donald E., 4,528,413, Cl. 585-440.000.
Musgrove, Neil R., to James Hardie Industries Limited. Selective-flush cistern. 4,527,296, Cl. 4-324.000.
Musser, John H.; and Kees, Kenneth L., to American Home Products Corporation. Aromatic compounds as antiallergic agents. 4,528,392, Cl. 560-43.000.
Mutoh Industry Ltd.: *See*—
Nakaoki, Tooru, 4,528,682, Cl. 377-24.000.
Mynott, Colin B.: *See*—
Ede, Douglas F. C.; Wilkinson, Brian S.; and Mynott, Colin B., 4,527,605, Cl. 144-286.00R.
Nabisco Brands, Inc.: *See*—
Wang, Martha Y.; Michnowski, Jane; Hnat, Diane L.; and Ross, Robert E., 4,528,202, Cl. 426-550.000.
Nagai, Tadashi: *See*—
Kumazawa, Tetsuo; Doi, Hiroaki; Miyadera, Yasuo; Fujioka, Atsushi; and Nagai, Tadashi, 4,528,223, Cl. 428-36.000.
Nagata, Hidetoshi: *See*—
Kaiho, Keisuke; and Nagata, Hidetoshi, 4,528,234, Cl. 428-216.000.
Nagata, Yoshitaka: *See*—
Emoto, Takao; and Nagata, Yoshitaka, 4,527,717, Cl. 222-593.000.
Nagron Steel and Aluminium B.V.: *See*—
Bertels, Augustinus W. M., 4,527,545, Cl. 126-433.000.
Naik, Appaya R., to Lever Brothers Company. Detergent compositions. 4,528,128, Cl. 252-549.000.
Naito, Hideki: *See*—
Kitaguchi, Hiroshi; and Naito, Hideki, 4,528,258, Cl. 430-203.000.
Nakaboh, Hiroshi: *See*—
Ogura, Ken; and Nakaboh, Hiroshi, 4,528,216, Cl. 427-387.000.
Nakagaki, Noboru; and Fujikawa, Yoyu. Warp-knitted lace strip. 4,527,404, Cl. 66-202.000.
Nakagawa, Osamu: *See*—
Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, 4,528,184, Cl. 424-79.000.
Nakagawa, Yasuo: *See*—
Kohno, Michinaga; Sugimoto, Koichi; and Nakagawa, Yasuo, 4,527,326, Cl. 29-705.000.
Nakahama, Ryoji, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Shifting apparatus for a propelling unit for a vessel. 4,527,441, Cl. 74-378.000.
Nakahata, Kozo; Kawaguchi, Ikuo; and Yamaguchi, Kazuo, to Hitachi, Ltd. Bit pattern generator. 4,528,634, Cl. 364-491.000.
Nakai, Kohzo: *See*—
Kasama, Masatoshi; and Nakai, Kohzo, 4,527,292, Cl. 2-452.000.
Nakajima, Fusao: *See*—
Ozone, Takashi; Hayakawa, Shohei; Nakajima, Fusao; Yamada, Keiichi; and Araki, Kazuo, 4,527,356, Cl. 51-101.00R.
Nakamura, Kousuke: *See*—
Matsushita, Yasuo; Nakamura, Kousuke; and Kosugi, Tetuo, 4,528,121, Cl. 252-516.000.
Nakano, Tsuyoshi: *See*—
Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, 4,528,034, Cl. 75-255.000.
Nakano, Yoshio; and Tonda, Masao, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for forming photoresist images. 4,528,262, Cl. 430-325.000.
Nakaoki, Tooru, to Mutoh Industry Ltd. Digital measuring instruments. 4,528,682, Cl. 377-24.000.
Nakata, Hitoshi: *See*—
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; Miyazaki, Jun; Fujimoto, Takahiko; and Nakata, Hitoshi, 4,527,615, Cl. 164-468.000.
Nakayama, Muneo: *See*—
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.
Nakazato, Kikuo: *See*—
Kigasawa, Kazuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, 4,528,372, Cl. 544-310.000.
Nakazima, Hirosi: *See*—
Namba, Kazuya; Yano, Kazuya; Nakazima, Hirosi; and Muraki, Yu, 4,527,699, Cl. 215-1.00C.
Nakazima, Ichiro: *See*—
Nishihata, Kouji; Nakazima, Ichiro; and Hirata, Mituo, 4,527,698, Cl. 212-187.000.
Nakos, Steven T.: *See*—
Lien, Qcheng S.; and Nakos, Steven T., 4,528,081, Cl. 204-159.130.
Namba, Kazuya; Yano, Kazuya; Nakazima, Hirosi; and Muraki, Yu, to Nippon Light Metal Co., Ltd. Vessel for storing liquid. 4,527,699, Cl. 215-1.00C.
Nanishi, Yasushi: *See*—
Miyazawa, Shintaro; Nanishi, Yasushi; Tada, Kohji; Kawasaki, Akihisa; and Kotani, Toshihiro, 4,528,061, Cl. 156-605.000.
Naokawa, Toyojiro; and Koterasawa, Matsuro, to National Semiconductor Corporation. Current supply for use in low voltage IC devices. 4,528,496, Cl. 323-315.000.
Napp, Wolfgang, to A. Nattermann GmbH & Coe KG. Process for obtaining ethanolic phosphatide fractions highly enriched with phosphatidylcholine. 4,528,139, Cl. 260-403.000.
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; Miyazaki, Jun; Fujimoto, Takahiko; and Nakata, Hitoshi, to Kabushiki Kaisha Kobe Seiko Sho. Electromagnetic within-mold stirring method of horizontal continuous casting and an apparatus therefor. 4,527,615, Cl. 164-468.000.
Nash, John E., to Syntex (U.S.A.) Inc. Gas-driven dental scaler having torque reaction means. 4,527,977, Cl. 433-120.000.
Nassauer, Konrad, to Borsig GmbH. Device for the supporting of horizontal, thermally loaded containers. 4,527,761, Cl. 248-128.000.
Nasu, Nobuo, to Kabushiki Kaisha Kawakami Seisakusho. Web laying machine. 4,527,789, Cl. 270-31.000.
National Research Development Corporation: *See*—
Graham, Neil B., 4,528,365, Cl. 528-392.000.
Radda, George K.; Waterton, John C.; and Gadian, David G., 4,528,509, Cl. 324-309.000.
National Semiconductor Corporation: *See*—
Kung, David, 4,528,463, Cl. 307-270.000.
Naokawa, Toyojiro; and Koterasawa, Matsuro, 4,528,496, Cl. 323-315.000.
Paoli, Mark A., 4,528,546, Cl. 338-195.000.
Naydowski, Reinhard: *See*—
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NCR Corporation: *See*—
Nelson, Hilding E.; Nesdahl, Myron A.; and Gallati, Marvin L., 4,528,458, Cl. 307-64.000.
van Driest, Hans, 4,528,519, Cl. 330-279.000.
Neary, Robin P.: *See*—
Carter, Leewood C.; and Neary, Robin P., 4,527,814, Cl. 281-31.000.
NEC Corporation: *See*—
Yoshida, Yasuharu, 4,528,512, Cl. 329-50.000.

Nelson, Gunner E., to Ethyl Corporation. Sodium aluminum hydride production. 4,528,176, Cl. 423-644.000.

Nelson, Hilding E.; Nesdahl, Myron A.; and Gallati, Marvin L., to NCR Corporation. Self-diagnostic redundant modular power supply. 4,528,458, Cl. 307-64.000.

Nelson, James A.: *See*—
Klein, Julian L.; Nelson, James A.; and Smith, Terrence J., 4,527,578, Cl. 134-57.00R.

Nelson, Jordan R.; and Bogner, Bruce F., to RCA Corporation. EMI/RFI Shielding composition. 4,528,213, Cl. 427-105.000.

Nelson, Kenneth L., to King-Seeley Thermos Co. Apparatus and method for making ice particles and method of making said apparatus. 4,527,401, Cl. 62-354.000.

Nelson, Marvin G., to Nelson's Upholstery, Inc. Support brace. 4,527,556, Cl. 128-80.00H.

Nelson, Wayne F., to A. Schulman, Inc. Plastic-metal laminate, process, and composition. 4,528,123, Cl. 252-511.000.

Nelson's Upholstery, Inc.: *See*—
Nelson, Marvin G., 4,527,556, Cl. 128-80.00H.

Nesdahl, Myron A.: *See*—
Nelson, Hilding E.; Nesdahl, Myron A.; and Gallati, Marvin L., 4,528,458, Cl. 307-64.000.

Neubauer, Jerry L.: *See*—
Pees, James M.; and Neubauer, Jerry L., 4,527,781, Cl. 267-64.240.

Neuman, Eli, to PerfectData Corporation. Disk storage and display container. 4,527,692, Cl. 206-444.000.

Newby, John C. Irrigation/fertilization control and distribution system. 4,527,353, Cl. 47-59.000.

Newjig Limited: *See*—
Ede, Douglas F. C.; Wilkinson, Brian S.; and Mynott, Colin B., 4,527,605, Cl. 144-286.00R.

News Vend 1, Inc.: *See*—
Harrell, Bob G., 4,527,711, Cl. 221-244.000.

NGK Insulators, Ltd.: *See*—
Kato, Nobuhide; and Murase, Takao, 4,528,086, Cl. 204-427.000.

Nguyen, Tinh; and Gaul, James M., to Atlantic Richfield Company. Preparation of molded lignocellulosic compositions using an emulsifiable polyisocyanate binder and an emulsifiable carboxy functional siloxane internal release agent. 4,528,154, Cl. 264-109.000.

Nichols, Richard A., to Rockwell International Corporation. Broadband quadrature phase modulator for control loop error generation in an IF combiner. 4,528,697, Cl. 455-139.000.

Nicholson, Peter N.: *See*—
Gordon, William R.; and Nicholson, Peter N., 4,528,449, Cl. 250-352.000.

Nicol, James C. B. Visual sensor systems. 4,528,593, Cl. 358-200.000.

Nied, Roland; Horlamus, Herbert; and Kaiser, Fritz, to Alpine Aktiengesellschaft Augsburg. Particle classifier. 4,528,091, Cl. 209-139.00R.

Niedballa, Ulrich; and Bottcher, Irmgard, to Schering Aktiengesellschaft. Antiinflammatory imidazole derivatives. 4,528,298, Cl. 514-398.000.

Nielsen, Keith H. Elevator suspension system. 4,527,810, Cl. 280-43.230.

Nielsen, Niels J.: *See*—
Cloutier, Frank L.; Low, Robert N.; McClelland, Paul H.; and Nielsen, Niels J., 4,528,577, Cl. 346-140.00R.

Niemerg, Joseph P.: *See*—
Huebner, Willi E.; and Niemerg, Joseph P., 4,528,467, Cl. 310-13.000.

Niessen, Edward: *See*—
Fiocco, Robert J.; and Niessen, Edward, 4,528,068, Cl. 196-14.520.

Nifco Inc.: *See*—
Omata, Nobuaki; and Oshida, Tsutomu, 4,527,675, Cl. 188-290.000.
Tanaka, Toshie, 4,527,821, Cl. 292-19.000.

Niggemann, Richard E., to Sundstrand Corporation. Direct contact liquid heater and heating method. 4,527,514, Cl. 122-31.00R.

Nihoshi, Toshiaki, to Nippon Kogaku K.K. Microscope provided with a photographing device. 4,527,869, Cl. 350-502.000.

Nikles, Erwin, to Ciba-Geigy Corporation. Polyalkylpiperidines. 4,528,374, Cl. 546-186.000.

Nils-Hakan, Wallin: *See*—
Gote, Helgesson; Bjorn, Mansson; and Nils-Hakan, Wallin, 4,528,309, Cl. 524-13.000.

Nio, Satoru; Sato, Shinobu; Nobayashi, Shigemi; and Hamashima, Toyoji, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Industrial articulated robot linear interpolation control device. 4,528,632, Cl. 364-169.000.

Nippon Chemical Plant Consultant Co., Ltd.: *See*—
Yamaguchi, Masanori; Tsutsumi, Yasuyuki; Nogita, Shunsuke; Shimada, Kazunari; and Maruko, Saburo, 4,528,251, Cl. 429-25.000.

Nippon Chemopharm Co., Ltd.: *See*—
Masaki, Mitsuo, 4,528,194, Cl. 514-255.000.

Nippon Electric Co., Ltd.: *See*—
Matsuura, Takashi, 4,528,522, Cl. 331-2.000.
Umeda, Tetsuo; Egami, Kazunari; Tsukakoshi, Naoto; and Nishijima, Yasuo, 4,528,692, Cl. 382-9.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakano, Yoshio; and Tonda, Masao, 4,528,262, Cl. 430-325.000.

Nippon Kogaku K.K.: *See*—
Maida, Osamu, 4,527,882, Cl. 354-442.000.
Nihoshi, Toshiaki, 4,527,869, Cl. 350-502.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Yamamoto, Sadahiro; and Ouchi, Chiaki, 4,528,046, Cl. 148-12.00E.

Nippon Light Metal Co., Ltd.: *See*—
Namba, Kazuya; Yano, Kazuya; Nakazima, Hirosi; and Muraki, Yu, 4,527,699, Cl. 215-1.00C.

Nippon Paint Co., Ltd.: *See*—
Konishi, Sakuichi; Shingo, Naohito; and Shibayama, Mathuo, 4,528,318, Cl. 524-504.000.

Nippon Soken, Inc.: *See*—
Mitsui, Takao; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,527,964, Cl. 418-55.000.
Takagi, Shigeru; and Tomita, Masahiro, 4,528,008, Cl. 55-485.000.

Nippon Steel Chemical Co., Ltd.: *See*—
Yoshimura, Tokuo; Hagiwara, Kunio; and Aiba, Akira, 4,528,304, Cl. 523-216.000.

Nippon Telegraph & Telephone: *See*—
Unagami, Takashi; and Tsujiyama, Bunjiro, 4,528,480, Cl. 315-169.100.

Nippon Telegraph & Telephone Public Corporation: *See*—
Edahiro, Takao; Inagaki, Nobuo; and Kurosaki, Shiro, 4,528,010, Cl. 65-18.100.
Miyazawa, Shintaro; Nanishi, Yasushi; Tada, Kohji; Kawasaki, Akihisa; and Kotani, Toshihiro, 4,528,061, Cl. 156-605.000.

Nippondenso Co., Ltd.: *See*—
Abe, Tomoaki; Kinugawa, Masumi; and Hiromasa, Shunichiro, 4,527,530, Cl. 123-494.000.
Hara, Masahiro; and Sakai, Toshiyasu, 4,528,444, Cl. 235-462.000.
Ito, Teruyoshi; and Abe, Shigeya, 4,527,535, Cl. 123-617.000.

Nishida, Susumu; Fuchigami, Tadashi; Kimura, Seiji; Kishi, Shunsaku; and Kobayashi, Akio, to Sanyo Electric Co., Ltd. Cooling device for refrigerator. 4,527,624, Cl. 165-184.000.

Nishihara, Motohisa: *See*—
Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; Kobori, Shigeyuki; and Nishihara, Motohisa, 4,527,428, Cl. 73-721.000.

Nishihata, Kouji; Nakazima, Ichiro; and Hirata, Mituo, to Hitachi, Ltd. Method of and apparatus for supporting rope of crane having articulating structure. 4,527,698, Cl. 212-187.000.

Nishijima, Ryoji: *See*—
Matsuo, Yoshiho; Nishijima, Ryoji; Yoshino, Atsuhiko; and Kawashima, Takai, 4,528,151, Cl. 264-83.000.

Nishijima, Yasuo: *See*—
Umeda, Tetsuo; Egami, Kazunari; Tsukakoshi, Naoto; and Nishijima, Yasuo, 4,528,692, Cl. 382-9.000.

Nishikawa, Toshio: *See*—
Tamura, Sadahiro; and Nishikawa, Toshio, 4,528,655, Cl. 369-126.000.

Nishimura, Toshihiro: *See*—
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.

Nishimura, Toyohiko; Uchida, Naomi; and Hiratani, Hajime, to Japan Chemical Research Co., Ltd. Method of producing human epidermal growth factor. 4,528,186, Cl. 424-99.000.

Nishimura, Yutaka: *See*—
Sato, Kanemasa; Ueno, Sadayasu; Oyama, Yoshishige; and Nishimura, Yutaka, 4,527,423, Cl. 73-118.000.

Nissan Chemical Industries, Ltd.: *See*—
Matsuo, Yoshiho; Nishijima, Ryoji; Yoshino, Atsuhiko; and Kawashima, Takai, 4,528,151, Cl. 264-83.000.

Nissan Maruzen Polyethylene Company: *See*—
Matsuo, Yoshiho; Nishijima, Ryoji; Yoshino, Atsuhiko; and Kawashima, Takai, 4,528,151, Cl. 264-83.000.

Nissan Motor Company, Limited: *See*—
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,528,687, Cl. 381-43.000.
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,527,654, Cl. 180-140.000.
Takeuchi, Mikio, 4,528,563, Cl. 340-903.000.
Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kensei, 4,528,045, Cl. 148-35.000.
Yoshida, Kenji; and Sanada, Yuichi, 4,527,465, Cl. 92-136.000.

Nissin Machine Works, Limited: *See*—
Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, 4,528,074, Cl. 204-16.000.

NL Industries, Inc.: *See*—
House, Roy F.; and Scearce, Forrest A., 4,528,104, Cl. 252-8.50M.
Stockton, James G., 4,527,425, Cl. 73-155.000.

Nobayashi, Shigemi: *See*—
Nio, Satoru; Sato, Shinobu; Nobayashi, Shigemi; and Hamashima, Toyoji, 4,528,632, Cl. 364-169.000.

Nobbe, Volker: *See*—
Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, 4,528,099, Cl. 210-489.000.

Nogita, Shunsuke: *See*—
Yamaguchi, Masanori; Tsutsumi, Yasuyuki; Nogita, Shunsuke; Shimada, Kazunari; and Maruko, Saburo, 4,528,251, Cl. 429-25.000.

Noguchi, Takanobu: *See*—
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,528,118, Cl. 252-500.000.

Nohmi Bosai Kogyo Co. Ltd.: *See*—
Yasukawa, Makoto; and Ishii, Kenji, 4,528,555, Cl. 340-630.000.

Noji, Takashi; Harao, Norio; and Obata, Yoshiharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a radiation excited input phosphor screen. 4,528,210, Cl. 427-70.000.

Nolek System AB: *See*—
Persson, John, 4,527,817, Cl. 285-96.000.

Nomoto, Reishi: *See*—
Eguchi, Yasukata; Nomoto, Reishi; and Takahashi, Masayoshi, 4,527,564, Cl. 128-339.000.

Nomura, Masami, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling an AC power elevator. 4,527,663, Cl. 187-29.00R.

Nomura, Norimasa: *See*—
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,527,878, Cl. 354-298.000.

Nomura, Yoshihisa: *See*—
Kondo, Hiroyuki; Yoshimura, Yoshikane; and Nomura, Yoshihisa, 4,527,709, Cl. 220-22.000.

Nordson Corporation: *See*—
Cobbs, Walter H., Jr.; and Rehman, William R., 4,527,712, Cl. 222-1.000.

North American Philips Consumer Electronics Corp.: *See*—
Gallaro, Anthony V., 4,528,477, Cl. 313-479.000.

Northern Telecom Limited: *See*—
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., 4,528,150, Cl. 264-36.000.
Charlebois, Leonard J.; D'Aoust, Ronald R.; and Huszarik, Fred A., 4,528,419, Cl. 174-88.00R.
Cheng, Chao-Jan; Donak, John R.; and Ahad, Samir E., 4,528,664, Cl. 370-110.300.
Fatovic, Peter; and Lafrance, Conrad D., 4,528,426, Cl. 179-121.00D.
Graves, Alan F.; and Dilley, James E., 4,528,550, Cl. 340-347.0DD.
Kish, Paul P.; and Discenza, Giovanni J., 4,528,420, Cl. 174-112.000.
Mein, Gordon F.; Terry, John B.; and Hicks, Gregory F., 4,528,676, Cl. 375-14.000.
Poulsen, Robert G.; Smith, Gerald M.; and Westwood, William D., 4,528,438, Cl. 219-121.0PE.
Sabri, Mohammed S., 4,528,584, Cl. 358-12.000.
Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., 4,527,848, Cl. 339-17.00M.
Webb, Michael J.; and Johnson, David W., 4,527,856, Cl. 339-206.00R.

Norton Christensen, Inc.: *See*—
Knowlton, Ruth H.; and Huang, Hsin, 4,527,642, Cl. 175-329.000.

Norwood Marking & Equipment Co., Inc.: *See*—
Davison, Charles F., 4,527,472, Cl. 101-219.000.
Davison, Charles F., 4,527,475, Cl. 101-316.000.

Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, to Nissan Motor Company, Limited. Spoken-instruction controlled system for an automotive vehicle. 4,528,687, Cl. 381-43.000.

NRM Corporation: *See*—
Singh, Anand P.; Blosser, Virgil Y.; and Crumbacher, Thomas A., 4,527,946, Cl. 425-42.000.

Nugent, Thomas J., to Voest-Alpine International Corporation. Continuous casting plant for continuously casting a metal melt. 4,527,609, Cl. 164-253.000.

Numakami, Hajime; and Kuroda, Hideyuki, to Zeon Kasei Co., Ltd. Opening and closing type louver device. 4,527,355, Cl. 49-82.000.

Numbers, Jody L.: *See*—
Knotter, David G.; and Numbers, Jody L., 4,527,579, Cl. 135-74.000.

Nussbickl, Walter, to Uvex Winter Optik GmbH. Safety goggles, in particular for work use. 4,527,291, Cl. 2-450.000.

Nusser, Alban, to Siemens Aktiengesellschaft. Device for inking an electrostatic charge image with toner particles. 4,527,884, Cl. 355-3.0DD.

NUSTEP Trenndusen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG.: *See*—
Grossstuck, Werner; and Schafer, Rainer, 4,528,007, Cl. 55-395.000.

Nygren, Alf S.: *See*—
Agback, Karl H.; and Nygren, Alf S., 4,528,367, Cl. 534-599.000.

O & S Manufacturing Company: *See*—
Rose, John A., 4,527,803, Cl. 277-1.000.

OAO Corporation: *See*—
Sargent, Jack, 4,528,630, Cl. 364-469.000.

Obata, Yoshiharu: *See*—
Noji, Takashi; Harao, Norio; and Obata, Yoshiharu, 4,528,210, Cl. 427-70.000.

Oberan, Daniel R.: *See*—
Oberan, Stephen L., 4,528,548, Cl. 340-323.00R.

Oberan, Stephen L., to Oberan, Daniel R. Validity signal apparatus for monitoring a line boundary. 4,528,548, Cl. 340-323.00R.

O'Brien, Edward J.: *See*—
Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., 4,527,745, Cl. 239-600.000.

Occidental Chemical Corporation: *See*—
Fifolt, Michael J.; and Forcucci, John, 4,528,109, Cl. 252-78.100.
Ranade, Gautam R.; and Salee, Gideon, 4,528,328, Cl. 525-71.000.

Occidental Research Corporation: *See*—
La Mori, Phillip N.; and Shih, Chien-Cheng J., 4,528,169, Cl. 423-231.000.

Oce-Nederland B.V.: *See*—
Polderman, Arie; Handels, Johannes W. H.; and Kuit, Johannes H., 4,528,257, Cl. 430-109.000.

Ochii, Kiyofumi; and Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory with selectively enabled precharge and sense amplifier circuits. 4,528,646, Cl. 365-203.000.

Ochs, Henrich: *See*—
Difflipp, Kurt; and Ochs, Henrich, 4,527,478, Cl. 101-415.100.

Oda, Hiroyuki: *See*—
Sakurai, Shigeru; Oda, Hiroyuki; Satow, Haruhiko; and Okimoto, Haruo, 4,527,534, Cl. 123-559.000.

Odetics, Inc.: *See*—
Bartholet, Stephen J., 4,527,650, Cl. 180-8.600.

Ofstead, Ronald F., to Minnesota Mining and Manufacturing Co. Copolymers of poly(vinyl trifluoroacetate) or poly(vinyl alcohol). 4,528,325, Cl. 525-60.000.

Ogasawara, Tomio: *See*—
Kurono, Masayasu; Nakagawa, Osamu; Iida, Takafumi; Ishiwata, Yoshiro; Ogasawara, Tomio; and Kuwayama, Meiji, 4,528,184, Cl. 424-79.000.

Ogawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Vane-type pump with rotatable casing therein driven from pump shaft. 4,527,968, Cl. 418-173.000.

Ogawa, Nobuo: *See*—
Itoh, Yasuo; Kato, Hideo; Ogawa, Nobuo; Koshinaka, Eiichi; Suzuki, Tomio; and Yagi, Noriyuki, 4,528,287, Cl. 514-254.000.

Ogawa, Yoichi: *See*—
Inaniwa, Masahiro; and Ogawa, Yoichi, 4,528,492, Cl. 320-36.000.

Ogura, Ken; and Nakaboh, Hiroshi, to Oki Electric Industry Co., Ltd. Process for forming heat-resistant resin films of polyimide and organosilicic reactants. 4,528,216, Cl. 427-387.000.

Ogura, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotating servomotor apparatus. 4,527,461, Cl. 91-519.000.

Ohara, Masanori: *See*—
Suzuki, Yoshihiro; Kinoshita, Hiroo; Sato, Masayasu; and Ohara, Masanori, 4,528,279, Cl. 502-200.000.

Ohlson, Carl E., to AO Medical Products AB. Fixing means for mounting X-ray films. 4,527,347, Cl. 40-361.000.

Ohmura, Hiroshi. Dual lens camera. 4,527,874, Cl. 354-195.120.

Ohnishi, Toshihiro: *See*—
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,528,118, Cl. 252-500.000.

Ohoka, Yuzo, to Honda Giken Kogyo Kabushiki Kaisha. Device for supporting and sealing a final drive shaft bearing in a speed change gear. 4,527,443, Cl. 74-417.000.

Ohsawa, Kenji; Ito, Takao; Ohsawa, Masayuki; and Kurata, Keiji, to Sony Corporation. Method of making multilayer circuit board. 4,528,064, Cl. 156-630.000.

Ohsawa, Masayuki: *See*—
Ohsawa, Kenji; Ito, Takao; Ohsawa, Masayuki; and Kurata, Keiji, 4,528,064, Cl. 156-630.000.

Ohsawa, Seiichi: *See*—
Koizumi, Michio; Iwata, Yasuo; and Ohsawa, Seiichi, 4,527,921, Cl. 400-618.000.

Ohtake, Yasuhisa: *See*—
Higashinakagawa, Emiko; Sato, Kanemitsu; Inaba, Michihiko; Ohtake, Yasuhisa; Kantou, Masaharu; and Itoh, Masayuki, 4,528,246, Cl. 428-596.000.

Okabe, Yoshie, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting specific color. 4,527,897, Cl. 356-407.000.

Okabe, Yoshio, to Aisin Seiki Kabushiki Kaisha. Sealed-type automatic tensioner. 4,527,462, Cl. 92-51.000.

Okada, Taiji: *See*—
Kigasawa, Kazuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, 4,528,372, Cl. 544-310.000.

Okano, Takashi, to Universal Pioneer Corporation. FM angular modulation system for video signal recording. 4,528,599, Cl. 358-328.000.

Oki Electric Industry Co., Ltd.: *See*—
Ogura, Ken; and Nakaboh, Hiroshi, 4,528,216, Cl. 427-387.000.

Okimoto, Haruo: *See*—
Sakurai, Shigeru; Oda, Hiroyuki; Satow, Haruhiko; and Okimoto, Haruo, 4,527,534, Cl. 123-559.000.

Okino, Tadashi, to Canon Kabushiki Kaisha. Flash device and/or photographic apparatus usable with the same. 4,527,880, Cl. 354-403.000.

Okoshi, Toru: *See*—
Tano, Kazuo; Sato, Keiichi; and Okoshi, Toru, 4,528,403, Cl. 568-454.000.

Okubo, Yoichi: *See*—
Tarumi, Niro; Okubo, Yoichi; and Yoshimoto, Seiichi, 4,528,351, Cl. 526-314.000.

Okuno, Osamu: *See*—
Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, 4,528,034, Cl. 75-255.000.

Okutu, Toshimitu: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; and Okutu, Toshimitu, 4,528,240, Cl. 428-323.000.

Olin Corporation: *See*—
Fair, David L.; Justice, David D.; and Woodard, Kenneth E., Jr., 4,528,077, Cl. 204-95.000.
Grolitzer, Marilyn A., 4,528,106, Cl. 252-8.55D.

Oliver, John E., Jr.; and Singer, Arnold M. Chemically cleaning aqueous fluid of insoluble solids. 4,528,102, Cl. 210-705.000.

Oltmann, Harold D.: *See*—
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,528,235, Cl. 428-220.000.

Olympia Werke AG: *See*—
Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, 4,528,573, Cl. 346-108.000.

Olympus Optical Co., Ltd.: *See*—
Hattori, Shinichiro, 4,527,552, Cl. 128-6.000.
Ishii, Fumiaki, 4,527,551, Cl. 128-4.000.

Mihara, Shinichi, 4,527,868, Cl. 350-454.000.
Omata, Nobuaki; and Oshida, Tsutomu, to Nifco Inc. Oil type damper. 4,527,675, Cl. 188-290.000.
Omron Tateisi Electronics, Co.: *See*—
Endo, Kimikazu, 4,528,442, Cl. 235-379.000.
Onasch, Jurgen; and Ehrenstein, Gottfried, to Richard Bergner GmbH & Co. Self-tapping screw. 4,527,932, Cl. 411-411.000.
O'Neal, John L. Convertible trailer apparatus. 4,527,826, Cl. 296-3.000.
Ong, Helen H.; and Profitt, James A., to Hoechst-Roussel Pharmaceuticals Inc. Benzo[b]thiophenes intermediates. 4,528,399, Cl. 568-43.000.
Oonaka, Hidemi; and Uchitani, Nobuki, to Toyota Jidosha Kabushiki Kaisha. Method and system for controlling intake flow between direct and helical intake passages of intake port of internal combustion engine. 4,527,519, Cl. 123-188.00M.
Oppelt, Arnulf: *See*—
Loeffler, Wilfried; and Oppelt, Arnulf, 4,528,510, Cl. 324-309.000.
Opto Systems Incorporated: *See*—
Willmore, James A.; and Miszkiewicz, Henry L., 4,528,445, Cl. 235-469.000.
Orbital Engine Company Proprietary Limited: *See*—
Koch, John W., 4,527,520, Cl. 123-196.00R.
Orion Automation Industries: *See*—
Tomasello, Carl A., Jr., 4,527,937, Cl. 414-273.000.
Orlarey, Maurice M., to Allied Corporation. Gyroscope erection system. 4,527,439, Cl. 74-5.430.
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., to Armour Pharmaceutical Company. [16-Alanine]calcitonin. 4,528,132, Cl. 260-112.50T.
Ortwein, Hermann, to Clouth Gummiwerke Aktiengesellschaft. Elastomeric railway-rail mount. 4,527,736, Cl. 238-283.000.
Osaki, Kiyoshi; and Koinuma, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine having single overhead camshaft. 4,527,518, Cl. 123-90.230.
Osawa, Michitaka, to Hitachi, Ltd. Wide band high output amplifier using a power field effect transistor as an output stage. 4,528,520, Cl. 330-300.000.
Oshida, Tsutomu: *See*—
Omata, Nobuaki; and Oshida, Tsutomu, 4,527,675, Cl. 188-290.000.
Oswald, Alexis A.; Merola, Joseph S.; Reisch, John C.; and Kastrup, Rodney V., to Exxon Research and Engineering Co. High temperature hydroformylation in the presence of triarylphosphine rhodium carbonyl hydride complex catalyst systems. 4,528,404, Cl. 568-454.000.
Otis Elevator Company: *See*—
Doane, John C.; and Skalski, Clement A., 4,527,662, Cl. 187-29.00R.
Otsuka, Kanji: *See*—
Shirai, Yuji; Otsuka, Kanji; Usami, Tamotsu; and Yamasaki, Yasuyuki, 4,527,730, Cl. 228-179.000.
Ottaviani, Robert A.; Short, William T.; and Hart, Donald J., to General Motors Corporation. Sag control of high solid polyurethane clearcoats by urea thixotrope/silica systems. 4,528,319, Cl. 524-540.000.
Otterbacher, Eric W., to Dow Chemical Company, The. Preparation of hydroxyaromatic ethers. 4,528,394, Cl. 560-061.000.
Ouchi, Chiaki: *See*—
Yamamoto, Sadahiro; and Ouchi, Chiaki, 4,528,046, Cl. 148-12.00E.
Outokumpu Oy: *See*—
Andersson, Bengt T., 4,528,033, Cl. 75-73.000.
Ouwerkerk, Johannes H. W., to Hoogovens Groep B.V. Process of hot-rolling steel using a heat-reflecting screen. 4,527,409, Cl. 72-202.000.
Owens-Corning Fiberglas Corporation: *See*—
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,528,013, Cl. 65-136.000.
Uffner, William E.; and White, Robert N., 4,528,241, Cl. 428-378.000.
Owens-Illinois, Inc.: *See*—
Schaubeck, Paul E., 4,527,701, Cl. 215-220.000.
Sturgill, Dennis T., 4,528,012, Cl. 65-135.000.
Swartzbaugh, Peter T., 4,527,704, Cl. 215-252.000.
Swartzbaugh, Peter T.; and Hehl, Edward M., 4,527,706, Cl. 215-252.000.
Owens, Robert M.: *See*—
Goodwin, Anton E.; Marton, Janet L.; Owens, Robert M.; Whisenhunt, Jackie W.; and Swain, Roy D., 4,528,162, Cl. 422-101.000.
Oy Tampella Ab: *See*—
Sainio, Aimo, 4,527,640, Cl. 175-86.000.
Oyama, Yoshishige: *See*—
Sato, Kanemasa; Ueno, Sadayasu; Oyama, Yoshishige; and Nishimura, Yutaka, 4,527,423, Cl. 73-118.000.
Ozaki, Osamu, to Sanyei Corporation. Rotary direction regulator for synchronous electric motor. 4,527,671, Cl. 188-82.740.
Ozawa, Kunitaka: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,527,885, Cl. 355-3.00R.
Koumura, Noboru; Mitzusawa, Nobutoshi; and Ozawa, Kunitaka, 4,528,576, Cl. 346-140.00R.
Ozawa, Tetsuo: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
Ozone, Takashi; Hayakawa, Shohei; Nakajima, Fusao; Yamada, Keiichi; and Araki, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Cam grinding machine. 4,527,356, Cl. 51-101.00R.
Packard Instrument Company, Inc.: *See*—
Valenta, Robert J., 4,528,450, Cl. 250-362.000.
Paff, Leonard L. Ribbon joint installer. 4,527,321, Cl. 29-33.00R.
Paluch, Richard C.: *See*—
Dale, Steven M.; Paluch, Richard C.; and Setter, Gerald A., Jr., 4,527,909, Cl. 374-163.000.
Panduit Corp.: *See*—
Moody, Roy A.; Kirsinas, Peter; and Turek, James A., 4,527,328, Cl. 29-749.000.
Pannwitz, Karl-Heinz: *See*—
Eckstein, Wolfgang; Leichnitz, Kurt; Pannwitz, Karl-Heinz; Rabenecker, Horst; and Wolff, Gunter, 4,528,160, Cl. 422-86.000.
Paoli, Mark A., to National Semiconductor Corporation. High power thick film. 4,528,546, Cl. 338-195.000.
Papa, Anthony J., to Union Carbide Corporation. Aldol condensation of enolizable aldehydes using a metal carboxylate catalyst. 4,528,405, Cl. 568-463.000.
Papst, Georg: *See*—
von der Heide, Johann; and Papst, Georg, 4,528,466, Cl. 310-12.000.
Papst Motoren GmbH & Co. Kg: *See*—
Muller, Rolf, 4,528,483, Cl. 318-112.000.
Papst Motoren KG: *See*—
von der Heide, Johann; and Papst, Georg, 4,528,466, Cl. 310-12.000.
ParaMagnetic Logging, Inc.: *See*—
Vail, William B., III, 4,528,508, Cl. 324-303.000.
Park, Chung P., to Dow Chemical Company, The. Process for producing dimensionally stable polyolefin foams using environmentally acceptable blowing agent systems. 4,528,300, Cl. 521-79.000.
Park, Robert J.; and Leppik, Raymond A., to Commonwealth Scientific and Industrial Research Organization. Fermentation of bile. 4,528,272, Cl. 435-55.000.
Parker Hannifin Corporation: *See*—
Jurkovic, Paul J.; and Burrington, George C., 4,527,414, Cl. 72-402.000.
Parker, James J. Head rest attachment. 4,527,833, Cl. 297-397.000.
Parker, Stephen R.: *See*—
Tobery, Edward W.; and Parker, Stephen R., 4,527,397, Cl. 60-757.000.
Parma, Giovanni; and Bartolomucci, Francesco, to Fiat Auto S.p.A.; and Midis S.a.s. di Francesco Bartolomucci. Floor cleaning apparatus. 4,527,739, Cl. 239-186.000.
Parnell, R. L.: *See*—
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., 4,528,035, Cl. 75-257.000.
Passemard, Jean-Robert; and Keledjian, Gaston, to Regie Nationale des Usines Renault. Swivelling handle with three axes of rotation for an industrial robot. 4,527,945, Cl. 414-735.000.
Paulsen, Gary A.: *See*—
Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., 4,527,745, Cl. 239-600.000.
Payne, Charles H.: *See*—
Kent, William C.; and Payne, Charles H., 4,527,731, Cl. 228-180.200.
Payne, Philip W. Tapered tube impedance matching underwater voice communicator with bubble silencer. 4,527,657, Cl. 181-18.000.
Payne, Philip W. Bubble silencer for an underwater voice communicator. 4,527,658, Cl. 181-235.000.
Payne, Roger D., to Apollo Fire Detectors Limited. Short circuit fault isolation means for electrical circuit arrangements. 4,528,610, Cl. 361-62.000.
Peach, Robert C.: *See*—
Bowman, Roger; Peach, Robert C.; and Milverton, David R. J., 4,527,866, Cl. 350-358.000.
Pearson, Ernest J.: *See*—
Hayes, Michael H.; and Pearson, Ernest J., 4,528,255, Cl. 429-233.000.
Pearson, Kenneth A.; and Zimmerman, Luther L., to International Business Machines Corporation. Apparatus and method for scaling facsimile image data. 4,528,693, Cl. 382-47.000.
Peccoud, Michel: *See*—
Billon-Pierron, Claude; Chavand, Jean; and Peccoud, Michel, 4,528,435, Cl. 219-69.00M.
Pecoraro, Theresa A.; and Chianelli, Russell R., to Exxon Research and Engineering Co. Hydrogenation processes using carbon-containing molybdenum and tungsten sulfide catalysts. 4,528,089, Cl. 208-216.00R.
Pedersen, Bjorn O.; and Jost, Jonathan A., to Varian Associates, Inc. Apparatus for controlling thermal transfer in a cyclic vacuum processing system. 4,527,620, Cl. 165-80.00D.
Pees, James M.; and Neubauer, Jerry L., to General Motors Corporation. Pneumatic vehicle suspension unit with air sleeve guide. 4,527,781, Cl. 267-64.240.
Pellet, Regis J.: *See*—
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,528,414, Cl. 585-514.000.
Pence, Jerry W.: *See*—
Kamionka, Harvey E.; Pence, Jerry W.; and Tran, Dat M., 4,528,624, Cl. 364-200.000.
Perez, Robert. Tool for scarifying concrete. 4,527,728, Cl. 228-119.000.
PerfectData Corporation: *See*—
Neuman, Eli, 4,527,692, Cl. 206-444.000.
Perkins, William R.; and Cooper, James L. Musical instrument. 4,527,456, Cl. 84-1.040.
Perry, Michael W., to AT&T Bell Laboratories. Repeater housing and circuit mounting structure. 4,528,615, Cl. 361-386.000.

Person, Dennis W.; Pierce, Stanley L.; and Liang, Po-lung, to Ford Motor Company. Hydraulic control system for electronic transmission control. 4,527,448, Cl. 74-869.000.

Person, Martin: *See*—
Daumer, Rolf; Feldmann, Ekkehard; Person, Martin; Wild, Ernst; and Zechnall, Martin, 4,527,523, Cl. 123-419.000.

Persson, John, to Nolek System AB. Quick coupling device. 4,527,817, Cl. 285-96.000.

Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, to Agfa-Gevaert Aktiengesellschaft. Magnetic tape cassette. 4,527,691, Cl. 206-387.000.

Pervel Industries, Inc.: *See*—
Rzepecki, Ray M.; and Weiss, Victor H., 4,528,222, Cl. 428-35.000.

Peters, Dwight W.: *See*—
Dahlgren, Harold P.; Taylor, James E.; and Peters, Dwight W., 4,527,471, Cl. 101-148.000.
Dahlgren, Harold P.; Taylor, James E.; and Peters, Dwight W., 4,527,479, Cl. 101-450.100.

Peterson, Colleen S.: *See*—
Sturm, James E.; and Peterson, Colleen S., 4,527,330, Cl. 29-827.000.

Peterson, Gavrik: *See*—
Flaig, Terrance L.; and Peterson, Gavrik, 4,528,486, Cl. 318-254.000.

Peterson, Joe W., to Motorola, Inc. On chip voltage monitor and method for using same. 4,528,505, Cl. 324-158.00R.

Petric, Paul F.; Foley, Michael S.; Utlaut, Mark W.; and Laiacano, Joseph A., to Varian Associates, Inc. Gap control system for localized vacuum processing. 4,528,451, Cl. 250-441.100.

Petrzilka, Martin, to Hoffmann-La Roche Inc. Acetylenes. 4,528,114, Cl. 252-299.600.

Pettenpaul, Ewald: *See*—
Huber, Jakob; Pettenpaul, Ewald; and Petz, Felix, 4,528,518, Cl. 330-277.000.

Pettit, Frederick M. Pool entrance and supporting structure. 4,527,297, Cl. 4-496.000.

Petz, Felix: *See*—
Huber, Jakob; Pettenpaul, Ewald; and Petz, Felix, 4,528,518, Cl. 330-277.000.

Pfaff Haushaltmaschinen GmbH: *See*—
Kemmel, Patrice J., 4,527,496, Cl. 112-279.000.

Pfister, Hans; and Rupp, Gunter, to Siemens Aktiengesellschaft. Device for high gradient magnetic separation. 4,528,096, Cl. 210-222.000.

Pfizer Inc.: *See*—
Cue, Berkeley W., Jr.; and Moore, Bernard S., 4,528,387, Cl. 549-404.000.

Pharmacia AB: *See*—
Agback, Karl H.; and Nygren, Alf S., 4,528,367, Cl. 534-599.000.

Philip Morris Incorporated: *See*—
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Phillips Petroleum Company: *See*—
Blackwell, Jennings P., 4,528,310, Cl. 524-86.000.
Knudsen, Ronald D., 4,528,415, Cl. 585-527.000.
Selby, Larry M.; and Beever, William H., 4,528,335, Cl. 525-420.000.

Piccirilli, Robert: *See*—
Chang, Wen-Hsuan; and Piccirilli, Robert, 4,528,333, Cl. 525-398.000.

Pichl, Eduard: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, 4,528,174, Cl. 423-488.000.

Pieczenik, George. Method of inserting unique DNA sequences into DNA vectors. 4,528,266, Cl. 435-6.000.

Pierce, Jack D.: *See*—
Swallow, Roger T.; Jackson, William R.; and Pierce, Jack D., 4,527,402, Cl. 66-55.000.

Pierce, Stanley L.; Brown, Larry T.; and Jain, Pramod K., to Ford Motor Company. Transmission clutch control system and method. 4,527,678, Cl. 192-3.580.

Pierce, Stanley L.: *See*—
Person, Dennis W.; Pierce, Stanley L.; and Liang, Po-lung, 4,527,448, Cl. 74-869.000.

Pilgram, Kurt H.: *See*—
John, William W.; Pilgram, Kurt H.; and Martin, Mae E. F., 4,528,027, Cl. 71-93.000.

Pinchuk, Leonard: *See*—
Eckstein, Eugene C.; Block, Norman L.; Kline, Jacob; and Pinchuk, Leonard, 4,527,293, Cl. 623-12.000.

Pinto, Georges, to Creusot-Loire. Suspension and coupling device between a bogie frame and an axle box. 4,527,487, Cl. 105-223.000.

Pioneer Electronic Corporation: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,527,756, Cl. 242-68.300.

Piotroski, Peter N., to Pitney Bowes Inc. Apparatus for separating multiple webs of documents into discrete documents and forming the discrete documents into predetermined batches. 4,527,468, Cl. 101-2.000.

Piotroski, Peter N., to Pitney Bowes Inc. Apparatus and method for separating multiple webs of documents having the capability for orderly shut-down and re-start of operation. 4,527,790, Cl. 270-58.000.

Piotroski, Peter N., to Pitney Bowes Inc. Inserter system for forming predetermined batches of documents and inserting the batches into envelopes. 4,527,791, Cl. 270-58.000.

Pitney Bowes Inc.: *See*—
Piotroski, Peter N., 4,527,468, Cl. 101-2.000.
Piotroski, Peter N., 4,527,790, Cl. 270-58.000.
Piotroski, Peter N., 4,527,791, Cl. 270-58.000.
Soderberg, John H.; and Duwel, Edward C., 4,528,644, Cl. 364-900.000.

Pitt, Colin G., to United States of America, Health and Human Services. Chelating agents for the treatment of iron overload. 4,528,196, Cl. 514-533.000.

Pizzuti, Donato F.: *See*—
Whiteside, George D.; Keith, Laura E.; and Pizzuti, Donato F., 4,527,888, Cl. 354-400.000.

Plasko, Rudolph J.: *See*—
Bisacquino, Lenora A.; Dienes, Larry E.; and Plasko, Rudolph J., 4,528,590, Cl. 338-153.000.

Plastics Engineering Company: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,528,349, Cl. 526-262.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,528,373, Cl. 546-66.000.

Platt Luggage, Inc.: *See*—
March, Joseph E.; and Riley, Thomas E., 4,527,677, Cl. 190-110.000.

Plummer, Ernest L., to FMC Corporation. Trans-3-substituted-1-indanol and insecticidal ester derivatives. 4,528,408, Cl. 568-808.000.

Plymouth Tank of West Michigan, Inc.: *See*—
Dundas, Richard E.; and Visser, Gerald H., 4,527,708, Cl. 220-18.000.

Po, Jonathan B.: *See*—
Hoffman, Richard B.; and Po, Jonathan B., 4,527,288, Cl. 2-48.000.

Polaroid Corporation: *See*—
Whiteside, George D.; Keith, Laura E.; and Pizzuti, Donato F., 4,527,888, Cl. 354-400.000.

Polderman, Arie; Handels, Johannes W. H.; and Kuit, Johannes H., to Oce-Nederland B.V. Toner powder and method of forming fixed images. 4,528,257, Cl. 430-109.000.

Poldervaart, Leendert, to Single Buoy Moorings, Inc. Mooring system carried outboard by a rigid arm on a vessel. 4,527,501, Cl. 114-230.000.

Pommer, Ernst-Heinrich: *See*—
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,528,185, Cl. 424-81.000.

Pommer, Leslie M.: *See*—
Lastrina, Frank A.; Pommer, Leslie M.; and Mayer, Jeffrey C., 4,527,387, Cl. 60-39.092.

Pont-A-Mousson S.A.: *See*—
Bak, Claude; Bellocci, Rio; and Colmet, Serge, 4,527,608, Cl. 164-58.100.

Poque, James B.: *See*—
Whitley, Oran D.; and Poque, James B., 4,527,629, Cl. 166-321.000.

Porenski, Harry S.; and Sullivan, James W., to Brown & Williamson Tobacco Corporation. Device for manufacturing a mouthpiece and attaching mouthpieces to cigarette tobacco columns. 4,527,570, Cl. 131-94.000.

Poshkus, Algirdas C., to United States of America, National Aeronautics and Space Administration. Synthesis of 2,4,8,10-tetroxaspiro[5.5]undecane. 4,528,386, Cl. 549-335.000.

Pospisil, Robert S.: *See*—
Shackle, Peter W.; and Pospisil, Robert S., 4,528,461, Cl. 307-252.00L.
Shackle, Peter W.; and Pospisil, Robert S., 4,528,462, Cl. 307-252.00L.

Potter, James L.: *See*—
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Poulsen, Robert G.; Smith, Gerald M.; and Westwood, William D., to Northern Telecom Limited. End point control in plasma etching. 4,528,438, Cl. 219-121.0PE.

PPG Industries, Inc.: *See*—
Chang, Wen-Hsuan; and Piccirilli, Robert, 4,528,333, Cl. 525-398.000.
Chang, Wen-Hsuan, 4,528,344, Cl. 525-509.000.
Gagne, Robert; and Tsai, Yih-Wan, 4,527,617, Cl. 165-9.400.
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PQ Corporation: *See*—
Cambell, Thomas C.; Sherry, Howard S.; Schweiker, George C.; Falcone, James S., Jr.; and Sams, Robert H., deceased, 4,528,276, Cl. 502-62.000.

Prades, Jose F., to Vem De Tapas Metalicas, S.A. Bottle stopper. 4,527,705, Cl. 215-252.000.

Pravda, Milton F. Apparatus useful for rapidly determining the molecular weight of a flowing gaseous material. 4,527,417, Cl. 73-23.000.

Praxator, Helmut: *See*—
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Precision Machine Products, Inc.: *See*—
Hall, Kenneth R.; and Holste, James C., 4,527,435, Cl. 73-863.030.

Precitronic Gesellschaft fur Feinmechanik und Electronic m.b.H.: *See*—
Eichweber, Kurt, 4,527,483, Cl. 102-521.000.

Preformed Line Products Company: *See*—
Sprick, Theo, 4,527,854, Cl. 339-98.000.

Prenner, Herbert; Ulrich, Urban; Voser, Max; and Zimmerli, Beat, to BBC Brown, Boveri & Company, Limited. Compact A.C. machine having plural ventilation ducts. 4,528,469, Cl. 310-59.000.

Preston, Edward G.: *See—*
Arther, Hugh M.; Preston, Edward G.; Stewart, David B.; and Wood, Godfrey A., 4,528,050, Cl. 156-62.400.
Preston, John; and Carling, William R., to Imperial Chemical Industries, plc. Amide derivatives. 4,528,282, Cl. 514-19.000.
Preston, John S., to Council for Mineral Technology. Selective solvent extraction using organophosphorus and carboxylic acids and a non-chelating aldehyde oxime. 4,528,167, Cl. 423-139.000.
Prier, Donald G., to Dow Chemical Company, The. Removal of alkaline catalysts from polyether polyols and polyalkylene carbonate polyols. 4,528,364, Cl. 528-370.000.
Prime Computer, Inc.: *See—*
Bahr, Richard G.; and Hogan, Thomas C., 4,528,661, Cl. 370-86.000.
Pringle, Ronald E., to Camco, Incorporated. Hydraulic actuating means for subsurface safety valve. 4,527,630, Cl. 166-321.000.
Prins, Klaas H.: *See—*
Stiekel, Jan J.; Hagen, Marinus; Prins, Klaas H.; and Gerson, Philips M., 4,528,540, Cl. 337-102.000.
Prinz, Eckhard; and Kluss, Bruno, to Softal Electronic GmbH. Apparatus for the electric pretreatment of non-conductive foils. 4,527,969, Cl. 425-174.80E.
Prinz, Wolfgang: *See—*
Friese, Hans-Herbert; and Prinz, Wolfgang, 4,527,992, Cl. 8-94.210.
Pro-Staff Overload Enterprises Limited: *See—*
Foster, Joseph S., 4,527,516, Cl. 123-27.0GE.
Procter & Gamble Company, The: *See—*
Crawford, Robert J., 4,528,140, Cl. 260-402.500.
Purves, Edward R., 4,528,201, Cl. 426-262.000.
Trokhan, Paul D., 4,528,239, Cl. 428-247.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Balde, Daniel; and Boutemy, Gerard E. M., 4,528,026, Cl. 71-92.000.
Profitt, James A.: *See—*
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Prouty, Gerald G.: *See—*
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Purves, Edward R., to Procter & Gamble Co., The. Alkali-treated lecithin in fats. 4,528,201, Cl. 426-262.000.
Quackenbush, James E., to Computer Memories, Incorporated. Transconductance amplifier operable with bipolar input. 4,528,514, Cl. 330-146.000.
Qually, Marvin C.; and Vogt, Henry P. Wheelchair tilting device. 4,527,944, Cl. 414-678.000.
Rabenecker, Horst: *See—*
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Thiermann, William E., Sr., 4,527,651, Cl. 180-19.200.
Radda, George K.; Waterton, John C.; and Gadian, David G., to National Research Development Corporation. Spatially selective NMR. 4,528,509, Cl. 324-309.000.
Radochonski, Pierre: *See—*
Liepe, Steven F.; Radochonski, Pierre; and Johnson, Glenn R., 4,528,591, Cl. 358-160.000.
Radomski, Thomas A.: *See—*
Agarwal, Paul D.; Fruechte, Roger D.; Kade, Alexander; and Radomski, Thomas A., 4,527,653, Cl. 180-79.100.
Ragard, Phillip A.: *See—*
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Ragland, Frank R., Jr., to RCA Corporation. Color picture tube having spring supports for a mask-frame assembly. 4,528,475, Cl. 313-405.000.
Raj, Kuldip: *See—*
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Rampon Products, Inc.: *See—*
Swallow, Roger T.; Jackson, William R.; and Pierce, Jack D., 4,527,402, Cl. 66-55.000.
Ranade, Gautam R.; and Salee, Gideon, to Occidental Chemical Corporation. Blends of vinyl halide-polyolefin graft polymers and ASA polymers. 4,528,328, Cl. 525-71.000.
Raymond Corporation, The: *See—*
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RCA Corporation: *See—*
Alig, Roger T., 4,528,476, Cl. 313-412.000.
Aschwanden, Felix, 4,528,527, Cl. 332-19.000.
Bolger, Thomas V., 4,528,585, Cl. 358-22.000.
Cope, Appleton D., 4,528,596, Cl. 358-213.000.
Crowley, Albert T., 4,528,523, Cl. 331-10.000.
Dieterich, Charles B., 4,528,513, Cl. 329-145.000.
Fitts, Robert W.; and Smith, Edgar M., 4,528,447, Cl. 250-213.0VT.
Kane, James, 4,528,260, Cl. 430-321.000.
Lewis, Henry G., Jr.; and Limberg, Allen L., 4,528,586, Cl. 358-28.000.
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Read, Reginald A., to Regdon Corporation. Solenoid with tolerance control. 4,528,534, Cl. 335-262.000.
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Redwine, Fletcher H.; and Thompson, James E., to United States Steel Corporation. Reciprocable pump having axially pivotable manifold to facilitate valve inspection. 4,527,961, Cl. 417-454.000.
Rees, Richard W. A., to General Motors Corporation. Seat adjuster. 4,527,767, Cl. 248-419.000.
Reese, Herschel H.: *See—*
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Regie Nationale des Usines Renault: *See—*
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Rehman, William R.: *See—*
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Mar, Henry M.; and Reider, Samuel B., 4,527,390, Cl. 60-224.000.
Reiff, Helmut: *See—*
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Reil, Vladimir. Sterile earlobe piercing assembly. 4,527,563, Cl. 128-329.00R.
Reindl, Hans: *See—*
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Reinmuth, Klaus: *See—*
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Reisch, John C.: *See—*
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Renick, William A.; and Sutter, Donald W. Security lock for cassette recorders and cassette players or theft discouragement device for cassette recorders and cassette players. 4,527,405, Cl. 70-14.000.
Renner, Alfred, to Ciba-Geigy Corporation. Curable mixtures containing hydroxyalkyl-cyanoacetates, and the use thereof for producing cured products. 4,528,357, Cl. 528-93.000.
Renshaw, Theodore A., to Fairchild Industries, Inc. Stabilized ultrasonic welding apparatus. 4,527,727, Cl. 228-1.100.
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Rhone-Poulenc Specialites Chimiques: *See—*
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Richard, Joseph D.: *See—*
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Richards, Elmer A., to Eaton Corporation. Automatic mechanical transmission system. 4,527,447, Cl. 74-866.000.
Richards, Henry B. Pet bath and litter box combination. 4,527,511, Cl. 119-1.000.
Richardson, John J., to GAF Corporation. Dielectric film processor. 4,527,509, Cl. 418-650.000.
Richgels, Henry J.: *See—*
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Rickards, Anthony F., to Vitafin N.V. Dual chamber pacer with alternative rate adaptive means and method. 4,527,568, Cl. 128-419.0PG.

Rickey, Wynn P.; Dobson, Deborah H.; and Huffaker, Roger W., to Exxon Production Research Co. Method for pigging hydrocarbon product flowlines. 4,528,041, Cl. 134-8.000.

Ricoh Company, Ltd.: *See—*
Fujioka, Yoshisato; and Kawamura, Atsushi, 4,527,867, Cl. 350-427.000.
Kamiyama, Shin-ichi, 4,527,883, Cl. 355-3.0DR.
Satoh, Tsumori, 4,527,686, Cl. 198-807.000.
Yamane, Satoshi; and Suzuki, Toshitatsu, 4,527,892, Cl. 356-1.000.

Rieck, Hans-Peter; and Kalz, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the manufacture of zeolites. 4,528,172, Cl. 423-329.000.

Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, to Swiss Aluminium Ltd. Filter medium for filtering molten metals. 4,528,099, Cl. 210-489.000.

Riemer, Heinz: *See—*
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Riggins, Oral L.; Mills, Sherry J.; Warkentin, John H.; Stephans, Joseph P.; and Wisdom, Clancy O., to Westinghouse Electric Corp. Electrically operated switch having an improved linkage means. 4,528,433, Cl. 200-150.00C.

Riker Laboratories, Inc.: *See—*
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Riley, Thomas E.: *See—*
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Rinde, David L.: *See—*
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Rinker, Larry C., to Burroughs Corp. Mounting assembly for rotatable electrical connector. 4,527,847, Cl. 339-5.00R.

Risser, Dale M.: *See—*
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Ritchie, Joseph M.: *See—*
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Rivier, Jean E. F.: *See—*
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Robalova, Alena: *See—*
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Robbins, Alexander G., to General Electric Company. Multiple host face-pumped laser. 4,528,671, Cl. 372-68.000.

Robert Bosch GmbH: *See—*
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Breitling, Wolfram, 4,528,629, Cl. 364-431.110.
Clemens, Alexander, 4,527,962, Cl. 417-499.000.
Daumer, Rolf; Feldmann, Ekkehard; Person, Martin; Wild, Ernst; and Zechnall, Martin, 4,527,523, Cl. 123-419.000.
Grunwald, Werner, 4,527,427, Cl. 73-204.000.
Hafner, Udo; Krauss, Rudolf; and Langer, Werner, 4,527,744, Cl. 239-585.000.
Honig, Gunter; Kaiser, Gunther; Lotterbach, Gerhard; and Zucker, Udo, 4,527,422, Cl. 73-117.300.

Roberts, Charles D. Assembly for installation in chimney flues to direct stovepipe exhaust. 4,527,541, Cl. 126-123.000.

Robin, Jacques: *See—*
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,528,294, Cl. 514-327.000.

Robinson, Irwin J., III, to Intermark Industries, Inc. Display memory with write inhibit signal for transparent foreground pixel codes. 4,528,636, Cl. 364-521.000.

Robitaille, Martial J.: *See—*
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Rocha, Henry A. F., to General Electric Company. Current sensor. 4,528,502, Cl. 324-117.00R.

Rockwell International Corporation: *See—*
Davidson, Donald J., 4,527,668, Cl. 188-73.380.
Dorsman, Adrian K., 4,528,495, Cl. 323-268.000.
Fisher, Harry W.; and Hrivnak, Emil E., 4,527,600, Cl. 141-4.000.
Nichols, Richard A., 4,528,697, Cl. 455-139.000.
Wiegel, Roger E., 4,528,459, Cl. 307-66.000.

Rodney, Peter W. Driving habit monitor and sensor therefor. 4,528,547, Cl. 340-52.00R.

Roggero, Bruno: *See—*
Dotti, Giulio; and Roggero, Bruno, 4,527,592, Cl. 137-625.610.

Rogic, Milorad M.: *See—*
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,528,020, Cl. 71-28.000.

Rollform, Inc.: *See—*
Adams, George C., 4,527,369, Cl. 52-211.000.

Rolls-Royce Limited: *See—*
Mills, David, 4,528,043, Cl. 148-13.100.

Rom, Ernst: *See—*
Hirschmanner, Franz; and Rom, Ernst, 4,528,434, Cl. 219-10.49A.

Rood, Robert M.; and Wulfing, James J., to Minnesota Mining and Manufacturing Company. Hinged visor-type door for tape cassette. 4,527,755, Cl. 242-199.000.

Roof, James A., to General Motors Corporation. Antiglare rear view mirror. 4,527,860, Cl. 350-281.000.

Rose, Gerd: *See—*
Lorenz, Otto; and Rose, Gerd, 4,528,323, Cl. 524-839.000.

Rose, John A., to O & S Manufacturing Company. Bellows seal with groove edge folded over bead, for ball and socket joints. 4,527,803, Cl. 277-1.000.

Rosenbaum, Larry A.; and Sidaway, H. John, to Hancor, Inc. Method and apparatus for manufacturing foldable conduit. 4,527,319, Cl. 29-33.00T.

Rosenbaum, Leonard A., to CVD Equipment Corp. Automatic valve shut-off system. 4,527,715, Cl. 222-61.000.

Rosenberg, Jeffrey S.: *See—*
Murali, Beegamudre N.; Rosenberg, Jeffrey S.; and Cole, Clinton W., 4,527,954, Cl. 417-46.000.

Rosenfeld, Paul. Vacuum cane for picking up articles off the floor. 4,527,824, Cl. 294-64 100.

Rosenkranz, Wolfgang: *See—*
Ledebrink, Friedrich-Wilhelm; Rosenkranz, Wolfgang; and Stoll, Wolfgang, 4,528,130, Cl. 252-643.000.

Rosenthal, Eli: *See—*
Bedell, John R.; and Rosenthal, Eli, 4,527,613, Cl. 164-463.000.

Rosier, Kenneth M.: *See—*
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,528,504, Cl. 324-158.00F.

Ross, Robert E.: *See—*
Wang, Martha Y.; Michnowski, Jane; Hnat, Diane L.; and Ross, Robert E., 4,528,202, Cl. 426-550.000.

Rotesco Inc.: *See—*
Lang, John G., 4,527,426, Cl. 73-158.000.

Roth, David J.; Culler, Lawrence R.; and Heifner, Ralph D., to Atlantic Richfield Company. Metal recovery compression mechanism. 4,527,779, Cl. 266-227.000.

Rothe, Hans-Jochen: *See—*
Hofmann, Hansdieter; Rothe, Hans-Jochen; Skupin, Georg; and Wolff, Konrad, 4,528,362, Cl. 528-336.000.

Rothwell, Harold L., Jr.; and English, George J., to GTE Products Corporation. Single-ended metal halide discharge lamp with minimal color separation. 4,528,478, Cl. 313-631.000.

Roxburg, Dwight W.; and Magnuson, Linda M. Endotracheal tube anchoring mechanism. 4,527,559, Cl. 128-207.170.

Rubin, Fred K.; Van Blarcom, David; and Fox, Daniel J., to Lever Brothers Company. Alkaline cleaning compositions non-corrosive toward aluminum surfaces. 4,528,039, Cl. 134-2.000.

Rubin, Howard, to GemDialogue Systems, Inc. Method of characterizing the colored appearance of a gemstone. 4,527,895, Cl. 356-30.000.

Ruby, Philip R.: *See—*
Beidler, Richard F.; and Ruby, Philip R., 4,528,395, Cl. 560-067.000.

Ruckey, Allan M.: *See—*
Finn, Charles E.; Ruckey, Allan M.; and Shuler, David C., 4,527,528, Cl. 123-447.000.

Rudolphy, Albert, to Hoechst Aktiengesellschaft. Process for preparing printing ink binders, and their use in printing inks. 4,528,036, Cl. 106-30.000.

Ruehl, William E.; and DeMarco, Joseph P., to Illinois Tool Works Inc. Stackable hinging printed circuit board support. 4,527,312, Cl. 24-453.000.

Ruf, Hermann. Auxiliary table for extension and repositioning in medical operations. 4,527,555, Cl. 128-69.000.

Ruggera, Paul S.; and Kantor, Gideon, to United States of America, Health and Human Services. Helical coil for diathermy apparatus. 4,527,550, Cl. 128-1.500.

Rule Industries, Inc.: *See—*
Sydlowski, William E.; and Trent, Harold A., 4,527,449, Cl. 76-108.00R.

Rummel, Wolfgang: *See—*
Kreilein, Kurt; Geschonke, Hans; Rummel, Wolfgang; and Wiemer, Hardo, 4,528,337, Cl. 526-70.000.

Rundell, Herbert A., to Texaco Inc. Coupling for pipe or tubing. 4,527,818, Cl. 285-174.000.

Rundkvist, Kjell D.: *See—*
Andersson, Hans O. V.; Rundkvist, Kjell D.; and Samsioe, Per E., 4,528,608, Cl. 361-18.000.

Rupp, Gunter: *See—*
Pfister, Hans; and Rupp, Gunter, 4,528,096, Cl. 210-222.000.

Ruscheweyh, Hans, to Balcke-Durr Aktiengesellschaft. Apparatus for uniformizing the parameters of a flow and/or for mixing together at least two individual streams which discharge into a main flow. 4,527,903, Cl. 366-337.000.

Russell, Robert J., to Mail-Ex Corporation. Semi-automatic insertion machine. 4,527,378, Cl. 53-266.00A.

Rutherford, David A.; and Albers, Gerard P., to Texaco Inc. Protective riser-conductor for offshore structures. 4,527,928, Cl. 405-211.000.

Ryan, Gregory F.: *See—*
Ryan, Kathryn A.; and Ryan, Gregory F., 4,527,540, Cl. 126-42.000.

Ryan, Kathryn A.; and Ryan, Gregory F. Children's safety shield for appliances. 4,527,540, Cl. 126-42.000.

Ryan, Thomas G., to Cyclops Corporation. High performance composite floor structure. 4,527,372, Cl. 52-334.000.

Ryko Manufacturing Company: *See*—
Klein, Julian L.; Nelson, James A.; and Smith, Terrence J., 4,527,578, Cl. 134-57.00R.

Ryobi Limited: *See*—
Maruyama, Kenji; and Sazaki, Konin, 4,527,752, Cl. 242-84.20G.

Ryusyo Industrial Co., Ltd.: *See*—
Kawahara, Akira, 4,527,309, Cl. 24-68.0CD.

Rzepecki, Ray M.; and Weiss, Victor H., to Pervel Industries, Inc. Conductively printed flexible sheet material. 4,528,222, Cl. 428-35.000.

S.N.E.C.M.A.: *See*—
Forestier, Alexandre; and Joubert, Raymond J. M., 4,527,952, Cl. 416-220.00R.

Saar, Werner: *See*—
Lienhard, Paul; and Saar, Werner, 4,527,994, Cl. 8-494.000.

SAB Nife AB: *See*—
Emilsson, Fred S., 4,527,666, Cl. 188-33.000.

Sabo, Edward A.: *See*—
Groce, James S.; and Sabo, Edward A., 4,527,828, Cl. 296-65.00R.

Sabotta, Kenneth T.: *See*—
Evans, John H.; and Sabotta, Kenneth T., 4,527,481, Cl. 102-204.000.

Sabri, Mohammed S., to Northern Telecom Limited. Bilevel coding of color video signals. 4,528,584, Cl. 358-12.000.

Sachs, Hanns I.: *See*—
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., 4,528,117, Cl. 252-312.000.
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,528,153, Cl. 264-109.000.

Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., to Allied Corporation. Polymer films containing platelet particles. 4,528,235, Cl. 428-220.000.

Saether, Kolbjorn. Erecting precast horizontal slabs in building construction. 4,527,363, Cl. 52-122.100.

Saettler, Heinz: *See*—
Scharmer, Wolfgang; Saettler, Heinz; and Schlag, Eugen, 4,527,747, Cl. 241-26.000.

Sainio, Aimo, to Oy Tampella Ab. Working platform for a drilling apparatus. 4,527,640, Cl. 175-86.000.

St. Joseph Bank and Trust Company, executor: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,528,349, Cl. 526-262.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,528,373, Cl. 546-66.000.

Saito, Hideaki: *See*—
Emura, Junichi; Kanari, Issei; and Saito, Hideaki, 4,527,676, Cl. 188-299.000.

Saito, Masao: *See*—
Kasai, Yoshiaki; Hiraoka, Yasuo; Yuasa, Masaharu; Harada, Masataka; and Saito, Masao, 4,527,532, Cl. 123-520.000.

Saito, Seiji: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,527,885, Cl. 355-3.00R.

Saito, Setsuo: *See*—
Fushiya, Fusao; Inoue, Nobuhiro; and Saito, Setsuo, 4,527,380, Cl. 56-12.800.

Saito, Takao: *See*—
Moriyama, Masakazu; and Saito, Takao, 4,528,552, Cl. 340-525.000.

Saitoh, Shouji: *See*—
Sasaki, Akira; Mashiko, Kazuyuki; Saitoh, Shouji; and Hakoyama, Akiyoshi, 4,528,572, Cl. 346-76.0PH.

Sakaeda, Keiko: *See*—
Sashiki, Takashi; and Sakaeda, Keiko, 4,527,645, Cl. 177-1.000.

Sakai, Takayoshi; Sano, Shinji; and Matsumoto, Koji, to Yamazaki Machinery Works, Ltd. Method of controlling indexing of magazine pockets in machining center. 4,528,633, Cl. 364-474.000.

Sakai, Toshiyasu: *See*—
Hara, Masahiro; and Sakai, Toshiyasu, 4,528,444, Cl. 235-462.000.

Sakamoto, Akira: *See*—
Yamada, Muneki; and Sakamoto, Akira, 4,528,219, Cl. 428-35.000.

Sakamoto, Teruhisa; Ishida, Satoshi; Hironaka, Toshio; and Tsutsumi, Yukihiro, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of alcohols by hydration of olefins. 4,528,410, Cl. 568-897.000.

Sakaue, Tatsuo: *See*—
Iida, Tetsuya; and Sakaue, Tatsuo, 4,528,684, Cl. 377-60.000.

Sakurai, Shigeru; Oda, Hiroyuki; Satow, Haruhiko; and Okimoto, Haruo, to Mazda Motor Corporation. Fuel intake control system for supercharged engine. 4,527,534, Cl. 123-559.000.

Salacuse, Frank, to Super Glue Corporation. Adjustable clip system. 4,527,760, Cl. 248-108.000.

Salee, Gideon: *See*—
Ranade, Gautam R.; and Salee, Gideon, 4,528,328, Cl. 525-71.000.

Salk Institute For Biological Studies, The: *See*—
Lederis, Karl P.; MacCannell, Keith L.; and Rivier, Jean E. F., 4,528,189, Cl. 514-12.000.
Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,528,190, Cl. 514-12.000.

Sallee, John P.; and Liggett, Dennis. Fabric band making machine. 4,527,493, Cl. 112-121.270.

Salzman, Norman; and Wellner, Edward. Body coordination training aid. 4,527,982, Cl. 434-258.000.

Samansky, Terry. Foldable board game with triangular and trapazoidal areas. 4,527,800, Cl. 273-261.000.

Sams, Robert H., deceased: *See*—
Cambell, Thomas C.; Sherry, Howard S.; Schweiker, George C.; Falcone, James S., Jr.; and Sams, Robert H., deceased, 4,528,276, Cl. 502-62.000.

Sams, Ruth W., Legal Representative: *See*—
Cambell, Thomas C.; Sherry, Howard S.; Schweiker, George C.; Falcone, James S., Jr.; and Sams, Robert H., deceased, 4,528,276, Cl. 502-62.000.

Samsioe, Per E.: *See*—
Andersson, Hans O. V.; Rundkvist, Kjell D.; and Samsioe, Per E., 4,528,608, Cl. 361-18.000.

Sanada, Yuichi: *See*—
Yoshida, Kenji; and Sanada, Yuichi, 4,527,465, Cl. 92-136.000.

Sanchez, Jaime; and Sarin, Vinod K., to GTE Laboratories Incorporated. Mine tool roof bit insert and a method of drilling therewith. 4,527,638, Cl. 175-57.000.

Sanden Corporation: *See*—
Terauchi, Kiyoshi, 4,527,963, Cl. 418-55.000.

Sanders, David E.: *See*—
Sweeney, Dennis A.; and Sanders, David E., 4,528,674, Cl. 375-1.000.

Sanderson, John R.; and Watts, Lewis W., Jr., to Texaco Inc. Dicyclopentadiene derived ester compounds. 4,528,396, Cl. 560-256.000.

Sandine, William E.; and Huggins, Alan R., to State of Oregon by and through the Oregon State Board of Higher Education on behalf of Oregon State University, The. Method for producing single and/or mixed strain concentrates of bacteria. 4,528,269, Cl. 435-34.000.

Sandoz, Inc.: *See*—
Barcza, Sandor, 4,528,191, Cl. 514-63.000.

Sano, Shinji: *See*—
Sakai, Takayoshi; Sano, Shinji; and Matsumoto, Koji, 4,528,633, Cl. 364-474.000.

Sano, Yutaka; Iwasa, Koji; Kamamori, Hitoshi; Suginoya, Mitsuru; and Terada, Yumiko, to Seiko Instruments & Electronics Ltd. Method for manufacturing multicolored plate, multicolored filter and multicolored display device. 4,528,073, Cl. 204-15.000.

Sanraku-Ocean Co., Ltd.: *See*—
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,528,397, Cl. 514-400.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Nakahama, Ryoji, 4,527,441, Cl. 74-378.000.

Santrol Products, Inc.: *See*—
Graham, John W.; and Sinclair, A. Richard, 4,527,627, Cl. 166-280.000.

Sanwa Kagaku Kankyusho Co. Ltd.: *See*—
Kurono, Masayasu; Yamaguchi, Takuji; and Usui, Toshinao, 4,528,143, Cl. 260-465.00G.

Sanwa Seiki Mfg., Co. Ltd.: *See*—
Koyanagi, Yuzo; Koike, Tetuo; Suzuki, Takayuki; and Shiozaki, Tadakazu, 4,527,531, Cl. 123-501.000.

Sanyei Corporation: *See*—
Ozaki, Osamu, 4,527,671, Cl. 188-82.740.

Sanyo Electric Co., Ltd.: *See*—
Nishida, Susumu; Fuchigami, Tadashi; Kimura, Seiji; Kishi, Shunsaku; and Kobayashi, Akio, 4,527,624, Cl. 165-184.000.

Sargent, Jack, to OAO Corporation. Automatic registration control method and apparatus. 4,528,630, Cl. 364-469.000.

Sarin, Vinod K., to GTE Laboratories Incorporated. Indexable insert for mining drill. 4,527,931, Cl. 407-113.000.

Sarin, Vinod K.: *See*—
Sanchez, Jaime; and Sarin, Vinod K., 4,527,638, Cl. 175-57.000.

Sarkar, Arnab, to Corning Glass Works. Method of forming optical fiber having laminated core. 4,528,009, Cl. 65-3.120.

Sartori, Mario: *See*—
Melindo, Flavio; and Sartori, Mario, 4,528,425, Cl. 179-18.0HB.

Sasaki, Akira; Mashiko, Kazuyuki; Saitoh, Shouji; and Hakoyama, Akiyoshi, to Hitachi, Ltd. Thermal printer. 4,528,572, Cl. 346-76.0PH.

Sasamura, Kohei: *See*—
Moriyama, Masaru; and Sasamura, Kohei, 4,528,601, Cl. 360-46.000.

Sasaya, Hideaki: *See*—
Mitsui, Takao; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,527,964, Cl. 418-55.000.

Sashiki, Takashi; and Sakaeda, Keiko, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus. 4,527,645, Cl. 177-1.000.

Sato, Akihiko; and Watanabe, Akira, to Hino Jidosha Kogyo Kabushiki Kaisha. Bypass valve actuator for inertia supercharging in multicylinder engines. 4,527,392, Cl. 60-313.000.

Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, to Sato, Atsushige; Miura, Ishi; and G-C Dental Industrial Corp. Selenium-containing amalgam alloys for dental restoration and method for the preparation thereof. 4,528,034, Cl. 75-255.000.

Sato, Kanemasa; Ueno, Sadayasu; Oyama, Yoshishige; and Nishimura, Yutaka, to Hitachi, Ltd. Air flow meter for internal-combustion engine. 4,527,423, Cl. 73-118.000.

Sato, Kanemitsu: *See*—
Higashinakagawa, Emiko; Sato, Kanemitsu; Inaba, Michihiko; Ohtake, Yasuhisa; Kantou, Masaharu; and Itoh, Masayuki, 4,528,246, Cl. 428-596.000.

Sato, Keiichi: *See*—
Tano, Kazuo; Sato, Keiichi; and Okoshi, Toru, 4,528,403, Cl. 568-454.000.

Sato, Masayasu: *See—*
Suzuki, Yoshihiro; Kinoshita, Hiroo; Sato, Masayasu; and Ohara, Masanori, 4,528,279, Cl. 502-200.000.
Sato, Mikio: *See—*
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
Sato, Shinobu: *See—*
Nio, Satoru; Sato, Shinobu; Nobayashi, Shigemi; and Hamashima, Toyoji, 4,528,632, Cl. 364-169.000.
Sato, Yuji. Locking device for movable storage rack. 4,527,680, Cl. 192-4.00R.
Satoh, Tsumori, to Ricoh Co., Ltd. System for correcting deflection of belt from its normal path of movement. 4,527,686, Cl. 198-807.000.
Satow, Haruhiko: *See—*
Sakurai, Shigeru; Oda, Hiroyuki; Satow, Haruhiko; and Okimoto, Haruo, 4,527,534, Cl. 123-559.000.
Sattler, Helmut: *See—*
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Saturn Machine & Welding Co., Inc.: *See—*
Baird, William R.; and Baird, Billy C., 4,527,486, Cl. 105-215.00C.
Saunders, William T.: *See—*
Stoffel, Hans F.; Saunders, William T.; and Sporri, Anthony J., 4,527,412, Cl. 72-349.000.
Savard, Hassel J., Jr., to Golf-Eze, Inc. Golf cart and similar vehicles. 4,527,652, Cl. 180-19.300.
Savini, Charles: *See—*
Yeh, Chuen Y.; and Savini, Charles, 4,528,401, Cl. 568-408.000.
Savner, Suzanne M.: *See—*
Wolf, James F.; Savner, Suzanne M.; Maxfield, MacRae; and Shacklette, Lawrence W., 4,528,254, Cl. 429-197.000.
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha. Spray apparatus for applying a sharp-edged pattern of coating. 4,527,507, Cl. 118-314.000.
Sazaki, Konin: *See—*
Maruyama, Kenji; and Sazaki, Konin, 4,527,752, Cl. 242-84.20G.
Scearce, Forrest A.: *See—*
House, Roy F.; and Scearce, Forrest A., 4,528,104, Cl. 252-8.50M.
Schaber, Scott D.: *See—*
Burns, Gary D.; Mackenthun, Donald W.; and Schaber, Scott D., 4,528,665, Cl. 371-51.000.
Schaefer, Charles A.: *See—*
Geipel, Henry J., Jr.; Schaefer, Charles A.; White, Francis R.; and Wurstthorn, John M., 4,527,325, Cl. 29-571.000.
Schaeffer, Hans A. Dental preparation, article and method for storage and delivery thereof. 4,528,180, Cl. 424-52.000.
Schaetzle, Walter J. Cascade desiccant air-conditioning/air drying process and apparatus with cold thermal energy storage. 4,527,398, Cl. 62-94.000.
Schafer, Rainer: *See—*
Grossstuck, Werner; and Schafer, Rainer, 4,528,007, Cl. 55-395.000.
Scharmer, Wolfgang; Saettler, Heinz; and Schlag, Eugen, to Carl Schenck AG. Method and vibratory chute for treating goods. 4,527,747, Cl. 241-26.000.
Schaubeck, Paul E., to Owens-Illinois, Inc. Tamper indicating child resistant closure. 4,527,701, Cl. 215-220.000.
Scheel, John H., to Armco, Inc. Method of controlling substantially equal distribution of particulates from a multi-outlet distributor and an article constructed according to the method. 4,527,776, Cl. 266-44.000.
Scheidt & Bachmann GmbH: *See—*
Miller, Gert; Diers, Franz; and Hermanns, Hans-Josef, 4,527,577, Cl. 133-3.00H.
Schering Aktiengesellschaft: *See—*
Niedballa, Ulrich; and Bottcher, Irmgard, 4,528,298, Cl. 514-398.000.
Schering Corporation: *See—*
Witkowski, Joseph T.; and Sunday, Brooks R., 4,528,291, Cl. 514-301.000.
Schippers, Jan: *See—*
Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, 4,528,341, Cl. 525-438.000.
Schlag, Eugen: *See—*
Scharmer, Wolfgang; Saettler, Heinz; and Schlag, Eugen, 4,527,747, Cl. 241-26.000.
Schlink, Lawrence J., to Union Tank Car Company. Railroad tank car skid construction. 4,527,489, Cl. 105-358.000.
Schlotterbeck, Dietrich: *See—*
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,528,185, Cl. 424-81.000.
Schlotzhauer, Kenneth G., to Tektronix, Inc. Overdrive thermal distortion compensation for a Quinn cascomp amplifier. 4,528,517, Cl. 330-256.000.
Schlumberger Technology Corporation: *See—*
Bordon, Ernesto E., 4,527,636, Cl. 175-4.550.
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, to Wacker-Chemie GmbH. Method for preparing hydrogen chloride for the ethyleneoxichlorination process. 4,528,174, Cl. 423-488.000.
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., to Dow Chemical Company, The. Addition polymerizable aromatic sulfonium salts and polymers thereof. 4,528,384, Cl. 549-78.000.
Schmidt, Karl H.: *See—*
Krebser, Werner; and Schmidt, Karl H., 4,527,610, Cl. 164-287.000.
Schmidt, Paul J.; and Jefferies, Patrick J., to Hilton-Davis Chemical Co., The. Process for preparing 2-[bis(aryl)methyl]benzoic acids. 4,528,136, Cl. 260-391.000.
Schmidt, Torsten: *See—*
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Schmidt, Wallace E.: *See—*
Bales, Michael E.; and Schmidt, Wallace E., 4,527,542, Cl. 126-299.00D.
Schmidts, Kurt; and Schuett, Walter, to BASF Aktiengesellschaft. Tape cassette container. 4,527,690, Cl. 206-387.000.
Schmitt, Jean-Claude: *See—*
Gilles, Pieter; and Schmitt, Jean-Claude, 4,528,158, Cl. 422-63.000.
Schmitt, Josef, to Krup MaK Maschinenbau GmbH. Expelling mechanism for discharge tubes and drain tubes of submarines. 4,527,502, Cl. 114-319.000.
Schmitt, Jurgen: *See—*
Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, 4,528,573, Cl. 346-108.000.
Schmitt, Kirk D., to Mobil Oil Corporation. Substituted cyclic and heterocyclic methane sulfonates. 4,528,383, Cl. 549-78.000.
Schneider, Bernard: *See—*
Jupin, Alain; and Schneider, Bernard, 4,527,700, Cl. 215-32.000.
Schneider, Josef: *See—*
Hoffmann, Erwin; and Schneider, Josef, 4,527,442, Cl. 74-411.500.
Schneider, Wilhelm; and Seidel, Hans-Georg, to Heye, Hermann. Transfer station for a glass-forming machine. 4,528,018, Cl. 65-260.000.
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., to Bayer Aktiengesellschaft. Aqueous isocyanate emulsions and their use as binders in a process for the production of shaped articles. 4,528,117, Cl. 252-312.000.
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, to Bayer Aktiengesellschaft. Process for producing molded particulate articles utilizing a self-releasing binder based on a sulfonic acid modified isocyanate. 4,528,153, Cl. 264-109.000.
Schon, Lennart. Angle determinator of parallelogram type. 4,527,341, Cl. 33-455.000.
Schonenberger, Rolf: *See—*
Veith, Gustav G.; Schonenberger, Rolf; Thumser, Udo; and Ziegler, Georg, 4,527,484, Cl. 104-89.000.
Schreiber, William L.: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,528,402, Cl. 568-445.000.
Schreiner, Peter; Wegh, John R.; and Smith, Roger L., to Allied Corporation. Heat shield for a brake. 4,527,672, Cl. 188-264.00G.
Schroder, Christine: *See—*
Wichelhaus, Winfried; and Schroder, Christine, 4,528,149, Cl. 264-13.000.
Schuberth-Werk GmbH & Co. KG: *See—*
Zahn, Christian, 4,527,290, Cl. 2-416.000.
Schuett, Walter: *See—*
Schmidts, Kurt; and Schuett, Walter, 4,527,690, Cl. 206-387.000.
Schuette, Heinz. Modular building. 4,527,370, Cl. 52-282.000.
Schumacher, Heinz: *See—*
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,528,185, Cl. 424-81.000.
Schuster, Claus; and Homuth, Horst, to Hoechst Aktiengesellschaft. Process for producing transfer printing papers with foamed aqueous ink. 4,527,993, Cl. 8-471.000.
Schwab, Bernard, to Andre' Gueissaz et Cie, S.A. Assembly apparatus for making frames or panels. 4,527,784, Cl. 269-42.000.
Schwartzott, John M., to Macpherson, Inc. Sheet material stacking, conveying and cutting method and apparatus. 4,527,346, Cl. 38-144.000.
Schwehr, Gregory D.: *See—*
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Schweiker, George C.: *See—*
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Sciulli, Ronald D.: *See—*
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Scott, John R.: *See—*
Calenoff, Emanuel; Tsay, Yuh-Geng; Jones, Ruth M.; and Scott, John R., 4,528,267, Cl. 435-7.000.
Scott, Malcolm K., to McNeilab, Inc. Heteroaromatic derivatives of iminomethyl piperidines and use to inhibit gastric acid secretion. 4,528,293, Cl. 514-323.000.
Scragg, Edgar P. Separation of two liquids. 4,528,094, Cl. 210-114.000.
SDS Biotech Corporation: *See—*
Cryberg, Richard L.; and Bimber, Russell M., 4,528,400, Cl. 568-314.000.
SDS-Elektro GmbH: *See—*
Dietrich, Bernhard, 4,527,855, Cl. 339-104.000.
Seal, Douglas T.; and Haynes, Charles A., to Carrier Corporation. Electrical resistance heating assembly. 4,528,441, Cl. 219-532.000.
Sealectro Corp.: *See—*
Carter, Clyde T., 4,527,850, Cl. 339-75.00M.
Seamans, Thomas F., to Ionics, Incorporated. Electrolytic process for desulphurization and seed regeneration in coal fired magnetohydrodynamic (MHD) power generation systems. 4,528,173, Cl. 423-421.000.

Searfass, Harry I.: *See*—
Finn, William A.; and Searfass, Harry I., 4,528,236, Cl. 428-222.000.
Sedgwick, Jim, to Genovation, Inc. Compact hybrid stethoscope. 4,528,690, Cl. 381-67.000.
Segaud, Christian, to Rhone-Poulenc Specialites Chimiques. Polymer/-filler modifying compositions. 4,528,303, Cl. 523-212.000.
Sei, Kazuo: *See*—
Inoue, Hiroshi; Sezume, Tadashi; Isoi, Masaaki; Iwanami, Kunio; and Sei, Kazuo, 4,528,329, Cl. 525-74.000.
Seidel, Hans-Georg: *See*—
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Seifert, Klaus, to Volkswagenwerk AG. Gear shift lever assembly. 4,527,913, Cl. 384-215.000.
Seiko Instruments & Electronics Ltd.: *See*—
Sano, Yutaka; Iwasa, Koji; Kamamori, Hitoshi; Suginoya, Mitsuru; and Terada, Yumiko, 4,528,073, Cl. 204-15.000.
Seino, Shuichi: *See*—
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, 4,527,507, Cl. 118-314.000.
Seitz, John E. Side view mirror truck windshield wiper. 4,527,301, Cl. 15-250.00B.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Komatsuzaki, Nobuyuki; Tsubone, Masahiro; and Machida, Bon, 4,528,221, Cl. 428-35.000.
Selby, Larry M.; and Beever, William H., to Phillips Petroleum Company. Polymer blends. 4,528,335, Cl. 525-420.000.
Sellier, Michel. Implantable reservoir for automatic watering of plants. 4,527,354, Cl. 47-81.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,528,065, Cl. 156-643.000.
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Sena, Ted: *See*—
Carter, James H.; Ledis, Stephen L.; Crews, Harold R.; Sena, Ted; and Larsen, Fred L., 4,528,274, Cl. 436-10.000.
Senba, Katsuaki; and Warabi, Junichi, to Kabushiki Kaisha Meidensha. Vacuum interrupter. 4,528,432, Cl. 200-144.00B.
Senmed, Inc.: *See*—
Chow, Hector; and Melling, Hugh, 4,527,724, Cl. 227-8.000.
Sentrachem Limited: *See*—
McDougall, Gloria, 4,528,166, Cl. 423-23.000.
Seshimoto, Osamu: *See*—
Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, 4,528,085, Cl. 204-416.000.
Setter, Gerald A., Jr.: *See*—
Dale, Steven M.; Paluch, Richard C.; and Setter, Gerald A., Jr., 4,527,909, Cl. 374-163.000.
Sezume, Tadashi: *See*—
Inoue, Hiroshi; Sezume, Tadashi; Isoi, Masaaki; Iwanami, Kunio; and Sei, Kazuo, 4,528,329, Cl. 525-74.000.
Shackle, Peter W.; and Pospisil, Robert S., to Harris Corporation. Integrated circuit switch using stacked SCRs. 4,528,461, Cl. 307-252.00L.
Shackle, Peter W.; and Pospisil, Robert S., to Harris Corporation. Integrated circuit switch using stacked SCRs. 4,528,462, Cl. 307-252.00L.
Shacklette, Lawrence W.: *See*—
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Shaffer, John W.: *See*—
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Shahbaz, Zalmai S.; and Frielinghaus, Klaus H., to General Signal Corporation. Automatic counting system for passages. 4,528,679, Cl. 377-6.000.
Shamie, Louis. Perambulator brake. 4,527,665, Cl. 188-20.000.
Shank, Joseph L., to Dynagel, Incorporated. Preparation of hydrolyzed collagen-containing products from non-gelled liquid hydrolyzed collagen concentrate and gelled products prepared therefrom. 4,528,204, Cl. 426-576.000.
Shank, William E., to Litton Industrial Products, Inc. Internal grinding machine. 4,527,357, Cl. 51-105.0SP.
Shanklin, Donald J., to Superior Industries International, Inc. Fuel tank locking apparatus. 4,527,407, Cl. 70-167.000.
Shanks, Ian A.: *See*—
Glasper, John L.; Shanks, Ian A.; and Clark, Michael G., 4,527,863, Cl. 350-336.000.
Shariff, Sadiq A.; Bharteey, Brij M.; and Mehkri, Shahab A., to Westinghouse Electric Corp. Electric control center having integral air-ventilation system. 4,528,614, Cl. 361-379.000.
Sharp Kabushiki Kaisha: *See*—
Hatta, Koichi; and Komeda, Kenichiro, 4,528,638, Cl. 364-709.000.
Ise, Masahiro; Tanaka, Hidehiko; and Machino, Katsuyuki, 4,528,677, Cl. 375-36.000.
Ishii, Yutaka; Minezaki, Shigehiro; Kozaki, Shuichi; and Funada, Fumiaki, 4,528,115, Cl. 252-299.630.
Miyoshi, Shuji; Sugihara, Takashi; and Hijikigawa, Masaya, 4,528,543, Cl. 338-35.000.
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.
Shaw, Wilfrid G.: *See*—
Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., 4,528,398, Cl. 562-534.000.
Shea, Lance L. Brace incorporating pulley mechanism. 4,527,289, Cl. 2-322.000.
Sheets, Marion S.: *See*—
Bresie, Don A.; Burns, Jack M.; Fowler, Donald W.; and Sheets, Marion S., 4,527,816, Cl. 285-81.000.
Shelhigh Inc.: *See*—
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Shell Oil Company: *See*—
Allen, Roy A., 4,528,356, Cl. 528-89.000.
Hwo, Charles C., 4,528,220, Cl. 428-35.000.
John, William W.; Pilgram, Kurt H.; and Martin, Mae E. F., 4,528,027, Cl. 71-93.000.
Lutz, Eugene F., 4,528,416, Cl. 585-527.000.
Sheltered Workshop for the Disabled, Inc.: *See*—
Blackington, Paul A., 4,528,617, Cl. 362-32.000.
Shenol, Kishan: *See*—
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Sheppard, John P.: *See*—
McCaffrey, David J. A.; and Sheppard, John P., 4,528,107, Cl. 252-61.000.
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Cambell, Thomas C.; Sherry, Howard S.; Schweiker, George C.; Falcone, James S., Jr.; and Sams, Robert H., deceased, 4,528,276, Cl. 502-62.000.
Shey-Ping, Larry S.: *See*—
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Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, to Nissan Motor Co., Ltd. Steering control system for automotive vehicle or the like. 4,527,654, Cl. 180-140.000.
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, to Sanraku-Ocean Co., Ltd. Aminocarboxylic acid derivatives. 4,528,397, Cl. 514-400.000.
Shibata, Shunichi, deceased (by Shibata, Towa, legal representative), to West Electric Company, Ltd. Illuminated finder. 4,527,875, Cl. 354-225.000.
Shibata, Towa, legal representative: *See*—
Shibata, Shunichi, deceased, 4,527,875, Cl. 354-225.000.
Shibatani, Haruo; Takahashi, Kunimasa; and Kameda, Takashi, to Mitsubishi Petrochemical Co., Ltd. Process for producing mesophase pitch. 4,528,087, Cl. 208-22.000.
Shibayama, Mathuo: *See*—
Konishi, Sakuichi; Shingo, Naohito; and Shibayama, Mathuo, 4,528,318, Cl. 524-504.000.
Shigehiro, Koga; Yoshihisa, Kanazawa; Takeshi, Okamoto; Masafumi, Yamanouchi; and Kazumichi, Shudo, to Chisso Corporation. Soft vinyl chloride resin composition. 4,528,306, Cl. 523-219.000.
Shih, Chien-Cheng J.: *See*—
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Shimada, Kazunari: *See*—
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Shimazaki, Hiroshi: *See*—
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Shimba, Satoru: *See*—
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Shimizu, Kiyoshi: *See*—
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Shimoji, Yasuo: *See*—
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Shimokawa, Kazuhiro: *See*—
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Shimomura, Yasuo: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
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Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Kaneko, Ichiro, 4,528,336, Cl. 526-62.000.
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Shinohara, Masanori: *See*—
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Shinosaki, Akira; and Amako, Shinji, to Kubota Ltd. Process for producing walking bar members for continuous casting. 4,527,411, Cl. 72-340.000.
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Koyanagi, Yuzo; Koike, Tetuo; Suzuki, Takayuki; and Shiozaki, Tadakazu, 4,527,531, Cl. 123-501.000.

Shirai, Yuji; Otsuka, Kanji; Usami, Tamotsu; and Yamasaki, Yasuyuki, to Hitachi, Ltd. Wire bonding apparatus. 4,527,730, Cl. 228-179.000.
Shomura, Eiichi: *See*—
Takenoya, Hideaki; and Shomura, Eiichi, 4,527,495, Cl. 112-264.100.
Short, William T.: *See*—
Ottaviani, Robert A.; Short, William T.; and Hart, Donald J., 4,528,319, Cl. 524-540.000.
Showalter, Merle R., to Automotive Engine Associates. Spherical valve lock-valve spring retainer assembly to minimize valve guide side loads. 4,527,774, Cl. 251-337.000.
Shuler, David C.: *See*—
Finn, Charles E.; Ruckey, Allan M.; and Shuler, David C., 4,527,528, Cl. 123-447.000.
Siano, Donald B.: *See*—
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Sibilia, John P.: *See*—
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,528,235, Cl. 428-220.000.
Siciliano, George R.: *See*—
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Sidaway, H. John: *See*—
Rosenbaum, Larry A.; and Sidaway, H. John, 4,527,319, Cl. 29-33.00T.
Siegel, Harvey R.: *See*—
Eggeman, Vincent A.; Bubb, Jerome D.; Siegel, Harvey R.; and Wichman, Francis H., 4,527,684, Cl. 192-130.000.
Siekierski, Walter R.; and Sterling, Michael, to Video Turf Incorporated. Random number generating techniques and gaming equipment employing such techniques. 4,527,798, Cl. 273-86.00R.
Siemens Aktiengesellschaft: *See*—
Auinger, Herbert, 4,528,472, Cl. 310-198.000.
Behringer, Wolfgang; Stockl, Klaus; and Weiland, Rolf-Juergen, 4,527,976, Cl. 433-33.000.
Fruhauf, Waldemar, 4,528,667, Cl. 371-55.000.
Glashauser, Walter, 4,528,071, Cl. 204-11.000.
Hauptmann, Rudolf, 4,528,565, Cl. 343-17.10R.
Huber, Jakob; Pettenpaul, Ewald; and Petz, Felix, 4,528,518, Cl. 330-277.000.
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,528,358, Cl. 528-94.000.
Loeffler, Wilfried; and Oppelt, Arnulf, 4,528,510, Cl. 324-309.000.
Nusser, Alban, 4,527,884, Cl. 355-3.0DD.
Pfister, Hans; and Rupp, Gunter, 4,528,096, Cl. 210-222.000.
Siemensma, Sidonius V., to U.S. Philips Corporation. Filter device for making tea. 4,527,467, Cl. 99-279.000.
Sigl, Wayne C., to Kimberly-Clark Corporation. Elasticized garment and method for its manufacture. 4,527,990, Cl. 604-385.00A.
Silverman, Richard B.: *See*—
Flint, Dennis H.; and Silverman, Richard B., 4,528,028, Cl. 71-113.000.
Silvestri, George J., Jr., to Westinghouse Electric Corp. Moisture separating device. 4,527,396, Cl. 60-685.000.
Silvestri, Victor J.: *See*—
Beyer, Klaus D.; and Silvestri, Victor J., 4,528,047, Cl. 148-175.000.
Simes, Societa Italiana Medicinalle Sintetici: *See*—
Vecchietti, Vittorio; Ferrari, Giorgio; and Casagrande, Cesare, 4,528,296, Cl. 514-346.000.
Simmons, Catherine J.: *See*—
Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,528,011, Cl. 65-30.130.
Simmons, Joseph: *See*—
Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,528,011, Cl. 65-30.130.
Simonyi, Miklos: *See*—
Kardos, Julianna; Maksay, Gabor; and Simonyi, Miklos, 4,528,131, Cl. 260-112.00R.
Simpson, Donald C., to Dresser Industries, Inc. Electropneumatic transducer system. 4,527,583, Cl. 137-82.000.
Simpson, James E., to United States of America, Air Force. Bipolar digitizer having compression capability. 4,528,549, Cl. 340-347.0AD.
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., to Metro Materials Corporation. Composition and process to create foaming slag cover for molten steel. 4,528,035, Cl. 75-257.000.
Sinclair, A. Richard: *See*—
Graham, John W.; and Sinclair, A. Richard, 4,527,627, Cl. 166-280.000.
Sinclair, David P., to Standard Oil Company (Indiana). Copolymers of hydroxymethylbenzoic acid and lactam. 4,528,361, Cl. 528-323.000.
Sines, Thomas E.; and Chermey, Yvette L. Battery-powered wheeled vehicle. 4,527,648, Cl. 180-6.500.
Singer, Arnold M.: *See*—
Oliver, John E., Jr.; and Singer, Arnold M., 4,528,102, Cl. 210-705.000.
Singer Company, The: *See*—
Dicke, William C., 4,527,360, Cl. 51-170.0TL.
Herron, William L.; and Speckman, John D., 4,527,494, Cl. 112-231.000.
Kerr, Alexander F.; and Kiyoshima, Hiroshi, 4,527,497, Cl. 112-313.000.
Singh, Anand P.; Blosser, Virgil Y.; and Crumbacher, Thomas A., to NRM Corporation. Tire curing press with pop-up, rotating nozzle. 4,527,946, Cl. 425-42.000.
Single Buoy Moorings, Inc.: *See*—
Poldervaart, Leendert, 4,527,501, Cl. 114-230.000.
Sivigny, Arthur L.: *See*—
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; Verzella, David J.; and Sivigny, Arthur L., 4,528,628, Cl. 364-424.000.
Skalski, Clement A.: *See*—
Doane, John C.; and Skalski, Clement A., 4,527,662, Cl. 187-29.00R.
SKF Nova AB: *See*—
Asberg, Sture, 4,527,916, Cl. 384-513.000.
Asberg, Sture, 4,527,924, Cl. 403-76.000.
SKF Steel Engineering AB: *See*—
Lund, Thore, 4,528,231, Cl. 428-148.000.
Skovgaard, Leif O., to Gople-Pack and Industrial Marketing ApS. Carry-bag. 4,528,694, Cl. 383-10.000.
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Kasafirek, Evzen; Fric, Premysl; Slaby, Jan; and Robalova, Alena, 4,528,133, Cl. 260-112.50R.
Slade, James R., Jr.; and Sterba, Richard F. System for weight lifting exercising. 4,527,797, Cl. 272-123.000.
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Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.
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te Velde, Ties S.; and Slob, Arie, 4,528,583, Cl. 357-71.000.
Smith, Boyd E.: *See*—
Haas, Louis M.; Williams, Joy L.; and Smith, Boyd E., 4,527,716, Cl. 222-83.500.
Smith, Donald E.: *See*—
Colvin, Howard A.; Fiedler, Ronald D.; Muse, Joel, Jr.; and Smith, Donald E., 4,528,413, Cl. 585-440.000.
Smith, Edgar M.: *See*—
Fitts, Robert W.; and Smith, Edgar M., 4,528,447, Cl. 250-213.0VT.
Smith, Gerald M.: *See*—
Poulsen, Robert G.; Smith, Gerald M.; and Westwood, William D., 4,528,438, Cl. 219-121.0PE.
Smith Kline & French Laboratories Limited: *See*—
Coates, William J.; and Warrington, Brian H., 4,528,371, Cl. 544-239.000.
Smith, Nathan R., to InTest Corporation. Electronic test head positioner for test systems. 4,527,942, Cl. 414-590.000.
Smith, Peter W.: *See*—
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,528,464, Cl. 307-425.000.
Smith, Robert, to ITT Industries, Inc. Circuit for digital FM demodulation. 4,528,511, Cl. 329-50.000.
Smith, Robert E., to Burr-Brown Corporation. Bar code reading system and method. 4,528,443, Cl. 235-462.000.
Smith, Roger L.: *See*—
Schreiner, Peter; Wegh, John R.; and Smith, Roger L., 4,527,672, Cl. 188-264.00G.
Smith, Ted. Bow string release device. 4,527,536, Cl. 124-35.00A.
Smith, Terrence J.: *See*—
Klein, Julian L.; Nelson, James A.; and Smith, Terrence J., 4,527,578, Cl. 134-57.00R.
Smith, Wesley H., to International Paper Company. Pouring spout opening configuration for a gable top of a container. 4,527,732, Cl. 229-17.00G.
Smith, William E.; and Battista, Richard A., to General Electric Company. Catalytic process for preparation of ortho-alkylated phenols. 4,528,407, Cl. 568-804.000.
Smith, Yoav M., to Westinghouse Electric Corp. Data acquisition system and analog to digital converter therefor. 4,528,637, Cl. 364-557.000.
Smithbauer, Donald J.; Lytle, Daniel R.; and Helms, Clifford, to Dataproducts Corporation. Pulley for band printers. 4,527,470, Cl. 101-111.000.
Smolik, Jiri: *See*—
Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, 4,528,006, Cl. 55-269.000.
SMW Schneider & Weisshaupt GmbH: *See*—
Hiestand, Karl, 4,527,808, Cl. 279-1.00J.
Snodgrass, Charles W.: *See*—
Simpson, William B., Jr.; Lundy, David F.; Parnell, R. L.; Snodgrass, Charles W.; Miller, Edward B.; and Harvey, John M., 4,528,035, Cl. 75-257.000.
Snyder, Larry L., to Harrison Western Corporation. Tunnel boring machine. 4,527,837, Cl. 299-31.000.
So, Eddy. Frequency compensating current circuit for a current comparator capacitance bridge. 4,528,498, Cl. 324-59.000.
Societa' Cavi Pirelli S.p.A.: *See*—
Dotti, Enrico, 4,528,148, Cl. 264-1.500.
Societe Anonyme D.B.A.: *See*—
Courbot, Pierre, 4,527,667, Cl. 188-73.340.
Courbot, Pierre, 4,527,670, Cl. 188-73.440.
Le Marchand, Claude, 4,527,664, Cl. 188-1.110.
Societe Anonyme D'Etudes, de Recherches et de Productions D'Agents Chimiques - E.R.P.A.C.: *See*—
Treyssac, Georges M.; and Morawek, Robert, 4,528,098, Cl. 210-414.000.

Societe de Recherches Industrielle S.O.R.I.: *See—*
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,528,294, Cl. 514-327.000.
Societe J.G. Allinquant: *See—*
Bich, Rene , 4,527,780, Cl. 267-64.120.
Societe Nationale d'Etude et Je Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See—*
Jumelle, Louis F.; and Soligny, Marcel R., 4,527,385, Cl. 60-39.070.
Soderberg, John H.; and Duwel, Edward C., to Pitney Bowes Inc. Customizing the firmware after assembly of an electronic postage meter. 4,528,644, Cl. 364-900.000.
Sodich, Ernest O.: *See—*
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Softal Electronic GmbH: *See—*
Prinz, Eckhard; and Kluss, Bruno, 4,527,969, Cl. 425-174.80E.
Sohne oHG: *See—*
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans J., 4,527,925, Cl. 403-143.000.
Sohyer, Jean-Pierre, to Essilor International Cie Generale d'Optique. Eyeglass frame front with flexible ties. 4,527,871, Cl. 351-106.000.
Solar Decisions, Inc.: *See—*
Fyfe, Donald W.; and Hoyt, Franklin S., 4,527,618, Cl. 165-18.000.
Solheim, Kasten. Golf club head. 4,527,799, Cl. 273-164.000.
Soligny, Marcel R.: *See—*
Jumelle, Louis F.; and Soligny, Marcel R., 4,527,385, Cl. 60-39.070.
Sommer Company: *See—*
Sommer, Gordon M., 4,527,681, Cl. 192-52.000.
Sommer, Gordon M., to Sommer Company. Variable speed drive unit with graduated increasing and decreasing speed profile. 4,527,681, Cl. 192-52.000.
Sony Corporation: *See—*
Abe, Fumiyoshi, 4,528,603, Cl. 360-70.000.
Asano, Hisashi, 4,528,653, Cl. 369-41.000.
Ishiguro, Mamoru; and Enomoto, Mitsutaka, 4,528,600, Cl. 360-14.100.
Ohsawa, Kenji; Ito, Takao; Ohsawa, Masayuki; and Kurata, Keiji, 4,528,064, Cl. 156-630.000.
Sorens, Dave A., to Kimberly-Clark Corporation. Creping adhesives containing polyvinyl alcohol and cationic polyamide resins. 4,528,316, Cl. 524-503.000.
South African Inventions Develop. Corp.: *See—*
Kolb, Peter J., 4,527,569, Cl. 128-660.000.
Souto, Alberto: *See—*
Maniscalco, Jack E.; and Souto, Alberto, 4,527,827, Cl. 296-3.000.
Spathis, George; and Korrasik, Anita C., to Clevepak Corporation. Adjustable pull bow. 4,528,217, Cl. 428-5.000.
Spearin, Elliott Y.: *See—*
DuBroff, William; Kaegi, Dennis D.; Knoerzer, Jerome J.; and Spearin, Elliott Y., 4,528,069, Cl. 201-20.000.
Speckman, John D.: *See—*
Herron, William L.; and Speckman, John D., 4,527,494, Cl. 112-231.000.
Spencer, Herbert J. C., to Telspec Limited. Sealing of electrical cable joints, equipment housings, or the like. 4,527,804, Cl. 277-1.000.
Spencer, William; and Jackovich, Melvin C., to Sundstrand Corporation. Detector for shorted rotating diode of a brushless alternator. 4,528,493, Cl. 322-99.000.
Spengler, Walter. Apparatus for conditioning a space by gas ionization. 4,528,612, Cl. 361-213.000.
Speranza, George P.; and Cuscurida, Michael, to Texaco Inc. Polyether polyols from mixed initiators. 4,528,112, Cl. 252-182.000.
Sperry Corporation: *See—*
Burns, Gary D.; Mackenthun, Donald W.; and Schaber, Scott D., 4,528,665, Cl. 371-51.000.
Criswell, Peter B., 4,528,640, Cl. 364-737.000.
Kline, Charles M., 4,527,655, Cl. 180-246.000.
Lang, Warren R., 4,528,545, Cl. 338-184.000.
Lew, Eugene K., 4,528,648, Cl. 365-236.000.
Mann, Harry F., 4,527,381, Cl. 56-209.000.
Spielberger, Richard K.: *See—*
Dunaway, Thomas J.; Spielberger, Richard K.; and Wittenberger, John C., 4,528,446, Cl. 250-216.000.
Spies, Volker: *See—*
Jorgensen, Peter; Molbaek, Jens J.; Spies, Volker; Dyhr-Mikkelsen, Poul C.; and Dam, Poul S., 4,527,595, Cl. 138-43.000.
Spilkin, Gordon; Eichler, Jack H.; and Kos, Peter, to Dorr-Oliver Incorporated. Pressure filter. 4,528,103, Cl. 210-791.000.
Spoeth, Carl R.: *See—*
Dobson, William C.; and Spoeth, Carl R., 4,528,429, Cl. 200-50.00B.
SPOFA, spojene podniky pro zdravotnickou vyrobu: *See—*
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Sporri, Anthony J.: *See—*
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Spraying Systems Co.: *See—*
Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., 4,527,745, Cl. 239-600.000.
Sprick, Theo, to Preformed Line Products Company. Method and apparatus for connecting branch circuits to cores of a live electrical cable. 4,527,854, Cl. 339-98.000.
Spring Water Brew International: *See—*
Coleman, Henry E., 4,528,200, Cl. 426-74.000.
Stade, Kurt: *See—*
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Stadler nee Szoke, Agnes: *See—*
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.
Staerzl, Richard E., to Brunswick Corporation. Cathodic protection controller. 4,528,460, Cl. 307-95.000.
Stager, David N.: *See—*
Cartier, Francis R.; Stager, David N.; and Acker, Roy M., 4,527,619, Cl. 165-41.000.
Stahl, Glenn L.: *See—*
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,528,132, Cl. 260-112.50T.
Stahl, Torbjorn; Hektoen, Per; and Karlsen, Oystein, to Moore Business Forms, Inc. Method for making overhead projection transparency. 4,528,054, Cl. 156-226.000.
Stanasolovich, David: *See—*
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Standard Oil Company: *See—*
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Standard Oil Company (Indiana): *See—*
Sinclair, David P., 4,528,361, Cl. 528-323.000.
Standard Oil Company (Ohio), The: *See—*
Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., 4,528,398, Cl. 562-534.000.
Stapleton, Thomas T., to General Motors Corporation. Distinctness of image meter. 4,527,898, Cl. 356-446.000.
Starkstrom Gummersbach GmbH: *See—*
Lemmer, Helmut, 4,528,535, Cl. 335-273.000.
Stascheit, Winfried: *See—*
Lubke, Herbert; and Stascheit, Winfried, 4,527,474, Cl. 101-247.000.
State Industries, Inc.: *See—*
Denton, Donald W., 4,527,543, Cl. 126-361.000.
State of Oregon by and through the Oregon State Board of Higher Education on behalf of Oregon State University, The: *See—*
Sandine, William E.; and Huggins, Alan R., 4,528,269, Cl. 435-34.000.
Stauffer Chemical Company: *See—*
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Steacy, Paul C., to UOP Inc. Dehydrocyclodimerization process. 4,528,412, Cl. 585-415.000.
Steers, Michel; Hazan, Jean-Pierre; and Courdille, Michel, to U.S. Philips Corporation. Door-open alarm device for a refrigerating appliance. 4,528,558, Cl. 340-686.000.
Steinberg, Mitchell I.: *See—*
Molloy, Bryan B.; and Steinberg, Mitchell I., 4,528,177, Cl. 424-1.100.
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, to Vyzkumny ustav bavinarsky. Method of and apparatus for producing multicomponent spun-twisted yarns by open-end spinning. 4,527,384, Cl. 57-404.000.
Stenkvist, Sven-Einar, to ASEA Aktiebolag. Ladle furnace with DC heating. 4,528,673, Cl. 373-108.000.
Stentz, Frankie B.; Wright, Reba K.; and Kitabchi, Abbas E., to University of TN Research Corporation. Method of separating A_{14}-^{125}I-insulin from heterogeneously labeled insulin molecules for biological studies. 4,528,134, Cl. 260-112.700.
Stepanek, Miroslac: *See—*
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.
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Sterba, Richard F.: *See—*
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Siekierski, Walter R.; and Sterling, Michael, 4,527,798, Cl. 273-86.00R.
Stetson, Harold W.; and Cabato, Nellie L., to TRW Inc. Ceramic glass material, capacitor made therefrom and method of making the same. 4,528,613, Cl. 361-321.000.
Stewart, Clyde R.: *See—*
Dimeff, John; and Stewart, Clyde R., 4,527,419, Cl. 73-40.50A.
Stewart, David B.: *See—*
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Stickel, Erick E.: *See—*
Sweet, Richard H.; Baker, Thomas J.; Stickel, Erick E.; and Gauthier, Emile, 4,527,315, Cl. 24-615.000.
Stiekel, Jan J.; Hagen, Marinus; Prins, Klaas H.; and Gerson, Philips M., to Texas Instruments Incorporated. Thermostat. 4,528,540, Cl. 337-102.000.
Stockl, Klaus: *See—*
Behringer, Wolfgang; Stockl, Klaus; and Weiland, Rolf-Juergen, 4,527,976, Cl. 433-33.000.
Stockton, James G., to NL Industries, Inc. System for detecting blow out and lost circulation in a borehole. 4,527,425, Cl. 73-155.000.

Stoffel, Hans F.; Saunders, William T.; and Sporri, Anthony J., to Stoffel Technologies, Inc. Method for making a necked container. 4,527,412, Cl. 72-349.000.

Stoffel Technologies, Inc.: *See*—
Stoffel, Hans F.; Saunders, William T.; and Sporri, Anthony J., 4,527,412, Cl. 72-349.000.

Stogner, Clarence H.; and Koerner, David J., to Xomox Corporation. Apparatus for moving a controlled member to a predetermined position. 4,527,769, Cl. 251-14.000.

Stol, Israel, to Westinghouse Electric Corp. High reliability double-chambered shielding system for welding. 4,528,436, Cl. 219-74.000.

Stolarz, Zofia: *See*—
Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, 4,528,116, Cl. 252-299.630.

Stolberg, Hermann J.: *See*—
Muller, Rudolf; and Stolberg, Hermann J., 4,527,773, Cl. 251-306.000.

Stolhand, James E.: *See*—
Cantu, Lisa A.; Yost, Marvin E.; Coffee, Robert L.; and Stolhand, James E., 4,527,626, Cl. 166-275.000.

Stoll, Kurt. Valve assembly. 4,527,589, Cl. 137-596.000.

Stoll, Wolfgang: *See*—
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Strachan, Gray, to Stranco Products, Inc. Multiple unit tape dispenser. 4,527,722, Cl. 225-106.000.

Stranco Products, Inc.: *See*—
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Strasser, Rudolf: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, 4,528,174, Cl. 423-488.000.

Straszewski, Klaus; Ender, Erhard; and Krutzfeldt, Herbert, to Autoflug-Stakupress GmbH & Co. Buckle for a safety belt. 4,527,317, Cl. 24-641.000.

Straus, Stephen H. Battery carrier. 4,527,823, Cl. 294-16.000.

Strausfeld, Hermann; and Kroenchen, Theo, to EMI Electrola Gesellschaft mit beschrankter Haftung. Disc record stamper alignment. 4,527,971, Cl. 425-409.000.

Strupczewski, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. Antihypertensive 1,2-benzisothiazole piperidines. 4,528,292, Cl. 514-321.000.

Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., to Hoechst-Roussel Pharmaceuticals Inc. 3-(4-Piperidyl)-1,2-benzisoxazoles. 4,528,376, Cl. 546-198.000.

Struthers, Ralph C. Fuel cell catholyte regenerating apparatus. 4,528,250, Cl. 429-19.000.

Stump, Lee E.; David, Eugene C.; and Boehne, Dale, to Timesavers, Inc. Segmented platen with diaphragm cylinder control. 4,527,359, Cl. 51-138.000.

Sturgill, Dennis T., to Owens-Illinois, Inc. Cogeneration from glass furnace waste heat recovery. 4,528,012, Cl. 65-135.000.

Sturm, James E.; and Peterson, Colleen S., to Motorola, Inc. Method for coupling an electronic device into an electrical circuit. 4,527,330, Cl. 29-827.000.

Sturm, Wolfgang; Mansfeld, Gerd; and Reindl, Hans, to Haarmann & Reimer GmbH. Aliphatic dicarboxylic acid esters as scents. 4,528,124, Cl. 252-522.00R.

Su, Dean T., to Colgate-Palmolive Company. Shaving cream gel containing interpolymer reaction product of selected cationic polymers and anionic polymers. 4,528,111, Cl. 252-107.000.

Suarez, Diego R. Container and handling apparatus therefor. 4,527,939, Cl. 414-382.000.

Sudweeks, E. M.: *See*—
Moon, Nancy J.; Ely, Lane O.; and Sudweeks, E. M., 4,528,199, Cl. 426-53.000.

Sugawara, Saburo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometric device. 4,527,881, Cl. 354-432.000.

Sugie, Toshinori; Ishikawa, Ryoichi; and Kobata, Fumihiro, to Dainippun Ink and Chemicals, Inc. Resin composition. 4,528,346, Cl. 525-523.000.

Sugihara, Takashi: *See*—
Miyoshi, Shuji; Sugihara, Takashi; and Hijikigawa, Masaya, 4,528,543, Cl. 338-35.000.

Sugimoto, Koichi: *See*—
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Suginoya, Mitsuru: *See*—
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Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,528,263, Cl. 430-544.000.

Sugita, Yutaka; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Ikeda, Tadashi, to Hitachi, Ltd. Magnetic bubble memory device. 4,528,645, Cl. 365-36.000.

Sugiura, Masami, to Tokyo Petcage Co., Ltd. Collapsible animal cage. 4,527,512, Cl. 119-19.000.

Sugizaki, Iwao: *See*—
Mizuno, Ichiro; and Sugizaki, Iwao, 4,527,336, Cl. 33-172.00R.

Sullivan, Donald F. Printed wiring boards with solder mask over bare copper wires having large area thickened circuit pad connections. 4,528,259, Cl. 430-312.000.

Sullivan, James W.: *See*—
Porenski, Harry S.; and Sullivan, James W., 4,527,570, Cl. 131-94.000.

Sulzer Brothers Limited: *See*—
Walch, Hansjorg, 4,527,598, Cl. 139-435.000.

Sumitomo Electric Industries: *See*—
Edahiro, Takao; Inagaki, Nobuo; and Kurosaki, Shiro, 4,528,010, Cl. 65-18.100.

Sumitomo Electric Industries, Ltd.: *See*—
Miyazawa, Shintaro; Nanishi, Yasushi; Tada, Kohji; Kawasaki, Akihisa; and Kotani, Toshihiro, 4,528,061, Cl. 156-605.000.

Sun Tech, Inc.: *See*—
Hsu, Chao-Yang, 4,528,278, Cl. 502-153.000.

Sunday, Brooks R.: *See*—
Witkowski, Joseph T.; and Sunday, Brooks R., 4,528,291, Cl. 514-301.000.

Sundstrand Corporation: *See*—
Chheda, Nemjee R., 4,527,580, Cl. 137-1.000.
Niggemann, Richard E., 4,527,514, Cl. 122-31.00R.
Spencer, William; and Jackovich, Melvin C., 4,528,493, Cl. 322-99.000.

Super Glue Corporation: *See*—
Salacuse, Frank, 4,527,760, Cl. 248-108.000.

Superior Industries International, Inc.: *See*—
Shanklin, Donald J., 4,527,407, Cl. 70-167.000.

Susemihl, Rolf. Warning device using power tool residual kinetic energy. 4,528,488, Cl. 318-382.000.

Sutt, Robert F., Jr., to Calgon Carbon Corporation. Carbon molecular sieves and a process for their preparation and use. 4,528,281, Cl. 502-402.000.

Sutter, Donald W.: *See*—
Renick, William A.; and Sutter, Donald W., 4,527,405, Cl. 70-14.000.

Sutton, Ernest S.: *See*—
Biddle, Richard A.; and Sutton, Ernest S., 4,527,389, Cl. 60-207.000.

Suzuki, Hidetoshi: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,527,885, Cl. 355-3.00R.

Suzuki, Kazuma, to Kabushiki Kaisha Riken. Solar heat collector. 4,527,547, Cl. 126-444.000.

Suzuki, Makoto; Takimoto, Toshiyuki; Yoshioka, Mamoru; and Masui, Takatoshi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling fuel injection for an internal combustion engine. 4,527,529, Cl. 123-478.000.

Suzuki, Makoto: *See*—
Gotoh, Hideo; Fukao, Satoshi; and Suzuki, Makoto, 4,528,428, Cl. 200-5.00A.
Yamamoto, Takemi; and Suzuki, Makoto, 4,527,918, Cl. 400-82.000.

Suzuki, Masatoshi: *See*—
Hayashi, Masayuki; and Suzuki, Masatoshi, 4,527,377, Cl. 53-167.000.

Suzuki, Ryo: *See*—
Sugita, Yutaka; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Ikeda, Tadashi, 4,528,645, Cl. 365-36.000.

Suzuki, Seikou: *See*—
Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; Kobori, Shigeyuki; and Nishihara, Motohisa, 4,527,428, Cl. 73-721.000.

Suzuki, Takayuki: *See*—
Koyanagi, Yuzo; Koike, Tetuo; Suzuki, Takayuki; and Shiozaki, Tadakazu, 4,527,531, Cl. 123-501.000.

Suzuki, Tomio: *See*—
Itoh, Yasuo; Kato, Hideo; Ogawa, Nobuo; Koshinaka, Eiichi; Suzuki, Tomio; and Yagi, Noriyuki, 4,528,287, Cl. 514-254.000.

Suzuki, Toshitatsu: *See*—
Yamane, Satoshi; and Suzuki, Toshitatsu, 4,527,892, Cl. 356-1.000.

Suzuki, Yoshihiro; Kinoshita, Hiroo; Sato, Masayasu; and Ohara, Masanori, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Cataler Industrical Co. Ltd. Monolithic catalyst for exhaust gas purification. 4,528,279, Cl. 502-200.000.

Swain, Roy D.: *See*—
Goodwin, Anton E.; Marton, Janet L.; Owens, Robert M.; Whisenhunt, Jackie W.; and Swain, Roy D., 4,528,162, Cl. 422-101.000.

Swain, Roy E.; and Clark, William E., to Carrier Corporation. Subzone diverter control. 4,527,734, Cl. 236-49.000.

Swallow, Roger T.; Jackson, William R.; and Pierce, Jack D., to Rampon Products, Inc. Program-controlled knitting machine, method and products thereof. 4,527,402, Cl. 66-55.000.

Swartzbaugh, Peter T., to Owens-Illinois, Inc. Tamper indicating package. 4,527,704, Cl. 215-252.000.

Swartzbaugh, Peter T.; and Hehl, Edward M., to Owens-Illinois, Inc. Tamper indicating package. 4,527,706, Cl. 215-252.000.

Sweeney, Dennis A.; and Sanders, David E., to E-Systems, Inc. Method and apparatus for baseband generation of a spread spectrum reference signal for use in an LMS adaptive array processor. 4,528,674, Cl. 375-1.000.

Sweeny, Norman P., to Minnesota Mining and Manufacturing Co. Stretchable microfragrance delivery article. 4,528,226, Cl. 428-40.000.

Sweet, George W., to Mead Corporation, The. Fluid jet print head having baffle means therefor. 4,528,571, Cl. 346-75.000.

Sweet, Richard H.; Baker, Thomas J.; Stickel, Erick E.; and Gauthier, Emile. Jewelry clasp. 4,527,315, Cl. 24-615.000.

Swerdloff, Michael D.: *See*—
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,528,020, Cl. 71-28.000.

Swihart, Terence J.; and Jones, James E., to Dow Corning Corporation. Polydimethylsiloxanes having improved thermal stability. 4,528,313, Cl. 524-397.000.

Swiss Aluminium Ltd.: *See—*
Rieger, Wolfhart; Gauckler, Lugwig; Kampfer, Konrad; Mauer, Albert; Dellapina, Marco; and Nobbe, Volker, 4,528,099, Cl. 210-489.000.

Sydlowski, William E.; and Trent, Harold A., to Rule Industries, Inc. Boring bit and method for manufacture thereof. 4,527,449, Cl. 76-108.00R.

Sylven, Hans; Enaerdal, Leif; and Berg, Lars-Eije, to AB Stil-Industri. Arrangement in a loop fitting or locking tongue for retractor-type safety belts. 4,527,313, Cl. 24-464.000.

Syntex (U.S.A.) Inc.: *See—*
Nash, John E., 4,527,977, Cl. 433-120.000.

Szcupak, Peter, to Chicago Rawhide Manufacturing Company. Multi-purpose fluid seal for movement control dampers and the like. 4,527,673, Cl. 188-269.000.

Szczucinski, Tomasz: *See—*
Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, 4,528,116, Cl. 252-299.630.

Szejtli, Jozsef: *See—*
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.

Tabakoff, Boris. Composition and method for reducing blood acetaldehyde levels. 4,528,295, Cl. 514-345.000.

Tachibana, Kouji, to Hitachi, Ltd. Controller with programmer for selectively providing programs to operate controller. 4,528,623, Cl. 364-191.000.

Tada, Kohji: *See—*
Miyazawa, Shintaro; Nanishi, Yasushi; Tada, Kohji; Kawasaki, Akihisa; and Kotani, Toshihiro, 4,528,061, Cl. 156-605.000.

Takada, Noboru: *See—*
Matsuda, Tadashi; Mizuno, Tsuneo; and Takada, Noboru, 4,528,575, Cl. 346-140.00R.

Takagi, Shigeru; and Tomita, Masahiro, to Nippon Soken, Inc. Dust collecting filter. 4,528,008, Cl. 55-485.000.

Takahara, Takao; and Shimokawa, Kazuhiro, to Daikin Kogyo Co., Ltd. Process for preparing fluorine-containing steroids. 4,528,137, Cl. 260-397.400.

Takahashi, Akira: *See—*
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,527,756, Cl. 242-68.300.

Takahashi, Kunimasa: *See—*
Shibatani, Haruo; Takahashi, Kunimasa; and Kameda, Takashi, 4,528,087, Cl. 208-22.000.

Takahashi, Masayoshi: *See—*
Eguchi, Yasukata; Nomoto, Reishi; and Takahashi, Masayoshi, 4,527,564, Cl. 128-339.000.

Takahashi, Sadatoshi; and Tateoka, Masamichi, to Canon Kabushiki Kaisha. Uniform speed scanning lens having a high resolving power. 4,527,858, Cl. 350-6.800.

Takahashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for diagnosing an internal combustion engine. 4,527,424, Cl. 73-119.00A.

Takase, Muneaki: *See—*
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,528,188, Cl. 424-116.000.

Takenoya, Hideaki; and Shomura, Eiichi, to Janome Sewing Machine Industry Co., Inc. Buttonhole stitching process. 4,527,495, Cl. 112-264.100.

Takeshi, Okamoto: *See—*
Shigehiro, Koga; Yoshihisa, Kanazawa; Takeshi, Okamoto; Masafumi, Yamanouchi; and Kazumichi, Shudo, 4,528,306, Cl. 523-219.000.

Takeshita, Masatoshi: *See—*
Sugita, Yutaka; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Ikeda, Tadashi, 4,528,645, Cl. 365-36.000.

Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, to Tokyo Keiki Company, Ltd. Pulse motor control apparatus. 4,528,491, Cl. 318-603.000.

Takeuchi, Mikio, to Nissan Motor Company, Limited. Rearward obstruction sensing system for automotive vehicle. 4,528,563, Cl. 340-903.000.

Takeuchi, Takashi: *See—*
Ito, Hiroshi; Hasegawa, Kyusei; Takeuchi, Takashi; and Ikenaga, Takayuki, 4,528,105, Cl. 252-8.55D.

Takimoto, Toshiyuki: *See—*
Suzuki, Makoto; Takimoto, Toshiyuki; Yoshioka, Mamoru; and Masui, Takatoshi, 4,527,529, Cl. 123-478.000.

Takita, Nobuhiro: *See—*
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,527,878, Cl. 354-298.000.

Takusagawa, Takashi: *See—*
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Tamura, Sadahiro; and Nishikawa, Toshio, to Murata Manufacturing Co., Ltd. Apparatus for detecting variation of electrostatic capacitance. 4,528,655, Cl. 369-126.000.

Tanaka, Harumi; and Iwata, Takashi, to Minolta Camera Kabushiki Kaisha. Exposure control shutter of a camera. 4,527,876, Cl. 354-229.000.

Tanaka, Hidehiko: *See—*
Ise, Masahiro; Tanaka, Hidehiko; and Machino, Katsuyuki, 4,528,677, Cl. 375-36.000.

Tanaka, Hirohisa: *See—*
Hamada, Tooru; Tanaka, Hirohisa; and Ishihara, Tomoo, 4,527,679, Cl. 192-3.580.

Tanaka, Toshie, to Nifco Inc. Latch device for door or lid. 4,527,821, Cl. 292-19.000.

Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kensei, to Nissan Motor Co., Ltd.; and Kabushikikaisha Riken. Heat-resisting spheroidal graphite cast iron. 4,528,045, Cl. 148-35.000.

Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, to Dainippon Screen Seizo Kabushiki Kaisha. Method and apparatus for controlling activity of developing solution against oxidation by using a test piece. 4,527,878, Cl. 354-298.000.

Taniuchi, Akira: *See—*
Fujita, Takeshi; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,528,360, Cl. 528-297.000.

Tano, Kazuo; Sato, Keiichi; and Okoshi, Toru, to Mitsubishi Chemical Industries Ltd. Hydroformylation process for preparation of aldehydes and alcohols. 4,528,403, Cl. 568-454.000.

Tarumi, Niro; Okubo, Yoichi; and Yoshimoto, Seiichi, to Hoya Lens Corporation. Plastic lens. 4,528,351, Cl. 526-314.000.

Tate, Clarence R., to Thalatta, Inc. Color changeable fabric containing micromagnets adhered to a substrate. 4,528,237, Cl. 428-240.000.

Tateoka, Masamichi: *See—*
Takahashi, Sadatoshi; and Tateoka, Masamichi, 4,527,858, Cl. 350-6.800.

Taylor, Francis M. Method and apparatus for optically measuring the distance to a workpiece. 4,527,893, Cl. 356-4.000.

Taylor, James E.: *See—*
Dahlgren, Harold P.; Taylor, James E.; and Peters, Dwight W., 4,527,471, Cl. 101-148.000.
Dahlgren, Harold P.; Taylor, James E.; and Peters, Dwight W., 4,527,479, Cl. 101-450.100.

Taylor-Winfield Corporation, The: *See—*
Challenger, Richard; and Mullane, William E., 4,528,057, Cl. 156-273.700.

Tazawa, Souichi, to Brother Kogyo Kabushiki Kaisha. Work-feed mechanism for a sewing machine. 4,527,498, Cl. 112-323.000.

Technion Research & Development Foundation, Inc.: *See—*
Cooper, Emanuel; and Kohn, David H., 4,528,164, Cl. 423-1.000.

Teichmann, Paul, to Trutzschler GmbH & Co. KG. Waste collector for a card. 4,527,307, Cl. 19-105.000.

Teikoku Oil Co., Ltd.: *See—*
Ito, Hiroshi; Hasegawa, Kyusei; Takeuchi, Takashi; and Ikenaga, Takayuki, 4,528,105, Cl. 252-8.55D.

Tektronix, Inc.: *See—*
Gross, Winthrop A., 4,528,515, Cl. 330-254.000.
Hill, Thomas C., III, 4,528,516, Cl. 330-254.000.
Liepe, Steven F.; Radochonski, Pierre; and Johnson, Glenn R., 4,528,591, Cl. 358-160.000.
Schlotzhauer, Kenneth G., 4,528,517, Cl. 330-256.000.
Waller, William G., 4,528,642, Cl. 364-900.000.

Telease, Inc.: *See—*
Block, Robert S.; and Martin, John R., 4,528,589, Cl. 358-122.000.

Telefonaktiebolaget LM Ericsson: *See—*
Andersson, Hans O. V.; Rundkvist, Kjell D.; and Samsioe, Per E., 4,528,608, Cl. 361-18.000.

Telspec Limited: *See—*
Spencer, Herbert J. C., 4,527,804, Cl. 277-1.000.

Terada, Yumiko: *See—*
Sano, Yutaka; Iwasa, Koji; Kamamori, Hitoshi; Suginoya, Mitsuru; and Terada, Yumiko, 4,528,073, Cl. 204-15.000.

Teramachi, Hiroshi. Linear slide ball bearing and production thereof and linear slide table using this ball bearing. 4,527,841, Cl. 308-6.00C.

Teramachi, Hiroshi. Construction for adjusting clearance in linear slide bearing. 4,527,842, Cl. 308-6.00C.

Terauchi, Kiyoshi, to Sanden Corporation. Scroll type compressor with lubricating system. 4,527,963, Cl. 418-55.000.

Terry, John B.: *See—*
Mein, Gordon F.; Terry, John B.; and Hicks, Gregory F., 4,528,676, Cl. 375-14.000.

Teshima, Iwao: *See—*
Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kensei, 4,528,045, Cl. 148-35.000.

te Velde, Ties S.; and Slob, Arie, to U.S. Philips Corporation. Programmable semiconductor device and method of manufacturing same. 4,528,583, Cl. 357-71.000.

Texaco Inc.: *See—*
Espedal, Michael L., 4,527,997, Cl. 48-86.00R.
Howlett, Donald L.; Meyer, Herbert J.; and Zimmer, Stanley F., 4,528,650, Cl. 367-79.000.
Rundell, Herbert A., 4,527,818, Cl. 285-174.000.
Rutherford, David A.; and Albers, Gerard P., 4,527,928, Cl. 405-211.000.
Sanderson, John R.; and Watts, Lewis W., Jr., 4,528,396, Cl. 560-256.000.
Speranza, George P.; and Cuscurida, Michael, 4,528,112, Cl. 252-182.000.
Waddill, Harold G., 4,528,308, Cl. 523-466.000.
Waddill, Harold G., 4,528,345, Cl. 525-523.000.

Texas Instruments Incorporated: *See—*
Cline, James H.; and Chastain, David M., 4,528,666, Cl. 371-51.000.

McDonough, Kevin C.; and Magar, Surendar S., 4,528,625, Cl. 364-200.000.
Stiekel, Jan J.; Hagen, Marinus; Prins, Klaas H.; and Gerson, Philips M., 4,528,540, Cl. 337-102.000.
Tezuka, Katsue, to Shinano Kenshi Kabushiki Kaisha. Permanent magnet type step motor. 4,528,473, Cl. 310-256.000.
Thalatta, Inc.: *See*—
Tate, Clarence R., 4,528,237, Cl. 428-240.000.
Thanh, Vo V.: *See*—
McKee, Kenneth E.; Meitl, Harold G.; Thanh, Vo V.; and Bixler, Craig A., 4,527,444, Cl. 74-493.000.
Thannheiser, Axel, to Trutzschler GmbH & Co. KG. Spinning preparation system and method for air-conditioning the same. 4,527,306, Cl. 19-66.0CC.
Thatcher, Gordon: *See*—
Duncombe, Edward; and Thatcher, Gordon, 4,527,955, Cl. 417-50.000.
Theodore, Ares N.; and Chattha, Mohinder S., to Ford Motor Company. Non-aqueous dispersions based on capped stabilizers and reactants comprising polyfunctional monomers II. 4,528,317, Cl. 524-504.000.
Thiermann, William E., Sr., to Racine Federated Inc. Remote control handle assembly. 4,527,651, Cl. 180-19.200.
Thiokol Corporation: *See*—
Biddle, Richard A.; and Sutton, Ernest S., 4,527,389, Cl. 60-207.000.
Thompson, Herbert E., to Drivetec, Inc. Magnetic record/playback head positioning apparatus. 4,528,607, Cl. 360-106.000.
Thompson, James E.: *See*—
Redwine, Fletcher H.; and Thompson, James E., 4,527,961, Cl. 417-454.000.
Thomson-CSF: *See*—
Bert, Alain, 4,528,524, Cl. 331-56.000.
Eouzan, Jean-Yves, 4,528,595, Cl. 358-213.000.
Thomson Industries, Inc.: *See*—
Mugglestone, Peter; and Cline, John, 4,527,840, Cl. 308-6.00C.
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., to Harris Corporation. Pulsed linear integrated circuit tester. 4,528,504, Cl. 324-158.00F.
Thorogood, Peter B. Imidazole derivatives and salts thereof, their synthesis and intermediates and pharmaceutical formulations. 4,528,195, Cl. 514-396.000.
Thumser, Udo: *See*—
Veith, Gustav G.; Schonenberger, Rolf; Thumser, Udo; and Ziegler, Georg, 4,527,484, Cl. 104-89.000.
Timesavers, Inc.: *See*—
Stump, Lee E.; David, Eugene C.; and Boehne, Dale, 4,527,359, Cl. 51-138.000.
Tipton, Larry J.; and Alfermann, Larry D., to Bastian Advanced Systems, Inc. Knockdown shelving assembly. 4,527,490, Cl. 108-111.000.
Titeflex Corporation: *See*—
Desilets, Norman H.; Gazda, Chester T.; and Zamachaj, Richard A., 4,527,819, Cl. 285-287.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Inoue, Hiroshi; Sezume, Tadashi; Isoi, Masaaki; Iwanami, Kunio; and Sei, Kazuo, 4,528,329, Cl. 525-74.000.
Tobery, Edward W.; and Parker, Stephen R., to Westinghouse Electric Corp. Turbine combustor having enhanced wall cooling for longer combustor life at high combustor outlet gas temperatures. 4,527,397, Cl. 60-757.000.
Tobey, William H.; Coyner, John V.; and Gardner, William J., to Martin Marietta Corporation. Deployable truss. 4,527,362, Cl. 52-71.000.
Tockey, Darwin R., Jr. Worm carriers. 4,527,350, Cl. 43-55.000.
Togashi, Minoru: *See*—
Kita, Toshio; Ikeda, Nobumasa; Takusagawa, Takashi; Goto, Yoshiharu; Hayakawa, Hiroshi; and Togashi, Minoru, 4,527,606, Cl. 152-209.00R.
Tokyo Juki Industrial Co., Ltd.: *See*—
Barozzi, Gian P.; and Horeschi, Giancarlo, 4,527,922, Cl. 400-637.500.
Tokyo Keiki Company, Ltd.: *See*—
Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, 4,528,491, Cl. 318-603.000.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, 4,527,865, Cl. 350-357.000.
Tokyo Petcage Co., Ltd.: *See*—
Sugiura, Masami, 4,527,512, Cl. 119-19.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Emoto, Takao; and Nagata, Yoshitaka, 4,527,717, Cl. 222-593.000.
Higashinakagawa, Emiko; Sato, Kanemitsu; Inaba, Michihiko; Ohtake, Yasuhisa; Kantou, Masaharu; and Itoh, Masayuki, 4,528,246, Cl. 428-596.000.
Iida, Tetsuya; and Sakaue, Tatsuo, 4,528,684, Cl. 377-60.000.
Noji, Takashi; Harao, Norio; and Obata, Yoshiharu, 4,528,210, Cl. 427-70.000.
Ochii, Kiyofumi; and Iwahashi, Hiroshi, 4,528,646, Cl. 365-203.000.
Ogura, Kunio, 4,527,461, Cl. 91-519.000.
Okabe, Yoshie, 4,527,897, Cl. 356-407.000.
Tomasello, Carl A., Jr., to Orion Automation Industries. Automatic storage and distribution system. 4,527,937, Cl. 414-273.000.
Tomeraasen, Paul L.: *See*—
Davis, Thomas J.; and Tomeraasen, Paul L., 4,528,506, Cl. 324-225.000.
Tominaga, Akira, to Kansai Paint Co., Ltd. Heat-curable resin coating composition. 4,528,363, Cl. 528-370.000.
Tomita, Masahiro: *See*—
Takagi, Shigeru; and Tomita, Masahiro, 4,528,008, Cl. 55-485.000.
Tonda, Masao: *See*—
Nakano, Yoshio; and Tonda, Masao, 4,528,262, Cl. 430-325.000.
Tonobayashi, Hidemi: *See*—
Sawai, Katsumi; Komon, Koichi; Matsuoka, Isamu; Tonobayashi, Hidemi; Fujimura, Masaaki; Ito, Shiro; and Seino, Shuichi, 4,527,507, Cl. 118-314.000.
Toshiba Silicone Co., Ltd.: *See*—
Kimura, Hiroshi, 4,528,390, Cl. 556-450.000.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Kaiho, Keisuke; and Nagata, Hidetoshi, 4,528,234, Cl. 428-216.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Yamada, Muneki; and Sakamoto, Akira, 4,528,219, Cl. 428-35.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Sakamoto, Teruhisa; Ishida, Satoshi; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,528,410, Cl. 568-897.000.
Toyo Tire & Rubber Co., Ltd.: *See*—
Yoshie, Atsuyoshi; and Karasawa, Hiroyuki, 4,528,052, Cl. 156-117.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kondo, Hiroyuki; Yoshimura, Yoshikane; and Nomura, Yoshihisa, 4,527,709, Cl. 220-22.000.
Oonaka, Hidemi; and Uchitani, Nobuki, 4,527,519, Cl. 123-188.00M.
Suzuki, Makoto; Takimoto, Toshiyuki; Yoshioka, Mamoru; and Masui, Takatoshi, 4,527,529, Cl. 123-478.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Moriyama, Masakazu; and Saito, Takao, 4,528,552, Cl. 340-525.000.
Suzuki, Yoshihiro; Kinoshita, Hiroo; Sato, Masayasu; and Ohara, Masanori, 4,528,279, Cl. 502-200.000.
Tozzi, Michael A.: *See*—
Mauger, David W.; Lawrie, James W.; McCarthy, John T.; and Tozzi, Michael A., 4,527,376, Cl. 53-113.000.
Trampnau, Ulrich. Warning device for helicopters. 4,528,564, Cl. 340-946.000.
Tran, Danh C.: *See*—
Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,528,011, Cl. 65-30.130.
Tran, Dat M.: *See*—
Kamionka, Harvey E.; Pence, Jerry W.; and Tran, Dat M., 4,528,624, Cl. 364-200.000.
Transcopy, Inc.: *See*—
Burwasser, Herman, 4,528,242, Cl. 428-413.000.
Traub, Stefan, to Hewlett-Packard GmbH. Modified bridge circuit for measurement purposes. 4,528,499, Cl. 324-62.000.
Trent, Harold A.: *See*—
Sydlowski, William E.; and Trent, Harold A., 4,527,449, Cl. 76-108.00R.
Treybig, Duane S.; and Potter, James L., to Dow Chemical Company, The. Pyrazino pyrazine compounds as catalysts for preparing urethanes. 4,528,391, Cl. 560-026.000.
Treyssac, Georges M.; and Morawek, Robert, to Societe Anonyme D'Etudes, de Recherches et de Productions D'Agents Chimiques - E.R.P.A.C. Screw driven sludge thickeners. 4,528,098, Cl. 210-414.000.
Trier, Ferdinand, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung. Pendulum for damping or eliminating low excitation frequencies. 4,527,951, Cl. 416-145.000.
Trinn, Maria: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.
Tritton, Gary E.: *See*—
Tritton, Victor R.; Tritton, Gary E.; and Chevillard, Francis, 4,527,308, Cl. 24-30.50R.
Tritton, Victor R.; Tritton, Gary E.; and Chevillard, Francis, to Les Entreprises Tritton Ltee. Shield. 4,527,308, Cl. 24-30.50R.
Triumpf-Adler A.G. fur Buro und Informationstechnik: *See*—
Bergermann, Franz; and Prufer, Michael, 4,528,560, Cl. 340-709.000.
Trokhan, Paul D., to Procter & Gamble Company, The. Deflection member. 4,528,239, Cl. 428-247.000.
Truglio, William J. Apparatus for collecting and microscopically examining a specimen. 4,528,187, Cl. 422-102.000.
Trutzschler GmbH & Co. KG: *See*—
Teichmann, Paul, 4,527,307, Cl. 19-105.000.
Thannheiser, Axel, 4,527,306, Cl. 19-66.0CC.
TRW Inc.: *See*—
Stetson, Harold W.; and Cabato, Nellie L., 4,528,613, Cl. 361-321.000.
Trytko, David E.; and Wagner, Steven D., to Ampex Corporation. Chrominance inverting all-pass filter. 4,528,598, Cl. 358-314.000.
Tsai, Yih-Wan: *See*—
Gagne, Robert; and Tsai, Yih-Wan, 4,527,617, Cl. 165-9.400.
Tsay, Yuh-Geng: *See*—
Calenoff, Emanuel; Tsay, Yuh-Geng; Jones, Ruth M.; and Scott, John R., 4,528,267, Cl. 435-7.000.
Tseo, Gus G.; and Alpen, Mark E., to Warner-Lambert Company. Safety valve. 4,527,588, Cl. 137-565.000.
Tsubone, Masahiro: *See*—
Komatsuzaki, Nobuyuki; Tsubone, Masahiro; and Machida, Bon, 4,528,221, Cl. 428-35.000.

Tsuchiya, Tatsuhiko, to Alps Electric Co., Ltd. Driving device for tape recorder. 4,528,606, Cl. 360-96.300.
Tsuda, Yasuo: *See—*
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,528,263, Cl. 430-544.000.
Tsui, Tien-Fung, to Mobil Oil Corporation. Oil shale beneficiation by size reduction combined with heavy media separation. 4,528,090, Cl. 209-2.000.
Tsujiyama, Bunjiro: *See—*
Unagami, Takashi; and Tsujiyama, Bunjiro, 4,528,480, Cl. 315-169.100.
Tsukada, Masaharu: *See—*
Inoue, Takahiro; Hirayama, Kazuhiro; and Tsukada, Masaharu, 4,528,580, Cl. 346-160.000.
Tsukakoshi, Naoto: *See—*
Umeda, Tetsuo; Egami, Kazunari; Tsukakoshi, Naoto; and Nishijima, Yasuo, 4,528,692, Cl. 382-9.000.
Tsutsumi, Yasuyuki: *See—*
Yamaguchi, Masanori; Tsutsumi, Yasuyuki; Nogita, Shunsuke; Shimada, Kazunari; and Maruko, Saburo, 4,528,251, Cl. 429-25.000.
Tsutsumi, Yukihiro: *See—*
Sakamoto, Teruhisa; Ishida, Satoshi; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,528,410, Cl. 568-897.000.
Tsuyoshi Masumoto: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Hagiwara, Michiaki; and Yasuhara, Kiyomi, 4,527,614, Cl. 164-463.000.
Tumminia, Dennis R.: *See—*
Fisher, Julie M.; Tumminia, Dennis R.; and Behr, R. Douglas, 4,527,314, Cl. 24-587.000.
Tunks, Larry M.: *See—*
Combest, H. E. Buddy; and Tunks, Larry M., 4,527,429, Cl. 73-744.000.
Turek, James A.: *See—*
Moody, Roy A.; Kirsinas, Peter; and Turek, James A., 4,527,328, Cl. 29-749.000.
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, to Exxon Research & Engineering Company. Micellar process for the production of acrylamide-alkyl acrylamide copolymers. 4,528,348, Cl. 526-225.000.
Turrisi, Lisa, to Lever Brothers Company. Low calorie syrup. 4,528,205, Cl. 426-613.000.
Tyler, Michael D. Transmitter and receiver locating device. 4,528,566, Cl. 343-419.000.
Tyszkiewicz, Theodore J.: *See—*
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,528,142, Cl. 260-463.000.
UBE Industries, Ltd.: *See—*
Hayashi, Osamu; Kurihara, Hideo; and Matsumoto, Yukio, 4,528,340, Cl. 525-379.000.
Kondoh, Takehiko; and Kitajima, Masahiko, 4,527,973, Cl. 432-58.000.
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,528,004, Cl. 55-158.000.
Uchida, Naomi: *See—*
Nishimura, Toyohiko; Uchida, Naomi; and Hiratani, Hajime, 4,528,186, Cl. 424-99.000.
Uchino, Minoru: *See—*
Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kensei, 4,528,045, Cl. 148-35.000.
Uchitani, Nobuki: *See—*
Oonaka, Hidemi; and Uchitani, Nobuki, 4,527,519, Cl. 123-188.00M.
Udren, Eric A., to Westinghouse Electric Corp. Relay for pilot protection of electrical power lines. 4,528,611, Cl. 361-81.000.
Udren, Eric A., to Westinghouse Electric Corp. Nonlinear noise reduction apparatus with memory. 4,528,678, Cl. 375-104.000.
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, to Richter Gedeon Vegyeszeti Gyar Rt.; and Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt. Process for the intensification of microbiological conversions of steroids using cyclodextrin additives. 4,528,271, Cl. 435-55.000.
Udy, Lex L.; and Day, John T. Seismic explosive composition. 4,528,049, Cl. 149-21.000.
Ueda, Kenji, to Kabushiki Kaisha Ishida Koki Seisakusho. Hopper and support device therefor in automatic weighing apparatus. 4,527,647, Cl. 177-105.000.
Ueda, Yutaka: *See—*
Yoshida, Kaichiro; and Ueda, Yutaka, 4,527,597, Cl. 139-68.000.
Ueno, Hideo, to Brother Kogyo Kabushiki Kaisha. Electronic 3-mode typewriter/calculator with special dead keys and repeat keys. 4,527,917, Cl. 400-70.000.
Ueno, Sadayasu: *See—*
Sato, Kanemasa; Ueno, Sadayasu; Oyama, Yoshishige; and Nishimura, Yutaka, 4,527,423, Cl. 73-118.000.
Uffner, William E.; and White, Robert N., to Owens-Corning Fiberglas Corporation. Chemically modified asphalts and glass fibers treated therewith. 4,528,241, Cl. 428-378.000.
Uhde GmbH: *See—*
Ilgner, Hartmut; Kledewski, Peter; and Heun, Reinhard, 4,528,147, Cl. 261-128.000.
Uhri, Duane C., to Mobil Oil Corporation. Deep well process for slurry pick-up in hydraulic borehole mining devices. 4,527,836, Cl. 299-17.000.
Ullum, Henrik. Apparatus for automatic cleaning of killed poultry. 4,527,304, Cl. 17-11.000.
Ulrich, Urban: *See—*
Prenaer, Herbert; Ulrich, Urban; Voser, Max; and Zimmerli, Beat, 4,528,469, Cl. 310-59.000.
Ultrasonic Power Corporation: *See—*
Cook, Edward G., 4,527,901, Cl. 366-127.000.
Umbert, Juan, to Micron S.A.L. Quick action keyless drill chuck. 4,527,809, Cl. 279-64.000.
Umeda, Tetsuo; Egami, Kazunari; Tsukakoshi, Naoto; and Nishijima, Yasuo, to Nippon Electric Co., Ltd. Character segmenting apparatus for optical character recognition. 4,528,692, Cl. 382-9.000.
Umlauf, Norbert. Chain bridle equipment for keeping metal strip tensions at a constant level. 4,527,723, Cl. 226-172.000.
Unagami, Takashi; and Tsujiyama, Bunjiro, to Nippon Telegraph & Telephone. AC Drive type electroluminescent display device. 4,528,480, Cl. 315-169.100.
Ungchusri, Tep; and Jakubowski, William J., to FMC Corporation. Valve stem packing. 4,527,806, Cl. 277-124.000.
Union Carbide Canada Limited: *See—*
Fairlamb, George R., 4,527,587, Cl. 137-329.300.
Union Carbide Corporation: *See—*
Knopf, Robert J.; and Drake, Kenneth, 4,528,334, Cl. 525-404.000.
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,528,414, Cl. 585-514.000.
Papa, Anthony J., 4,528,405, Cl. 568-463.000.
Union Oil Company of California: *See—*
Hass, Robert H.; and Ward, John W., 4,528,277, Cl. 502-79.000.
Union Tank Car Company: *See—*
Schlink, Lawrence J., 4,527,489, Cl. 105-358.000.
Uniroyal, Inc.: *See—*
Blem, Allen R.; and McGuinness, James A., 4,528,022, Cl. 71-73.000.
Gencarelli, Richard A.; and Wheeler, Edward L., 4,528,381, Cl. 548-257.000.
United Aircraft Products, Inc.: *See—*
Kearns, Vaughn, 4,527,785, Cl. 269-71.000.
United Kingdom Atomic Energy Authority: *See—*
Cairns, James A.; and Ziegler, James F., 4,528,212, Cl. 427-96.000.
Duncombe, Edward; and Thatcher, Gordon, 4,527,955, Cl. 417-50.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Glasper, John L.; Shanks, Ian A.; and Clark, Michael G., 4,527,863, Cl. 350-336.000.
U.S. Automation Company: *See—*
Borodin, Daniel J., 4,527,446, Cl. 74-828.000.
U.S. Clinical Products, Inc.: *See—*
Cummings, Robert, 4,527,703, Cl. 215-232.000.
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Air Force: *See—*
Burrows, James L., 4,528,641, Cl. 364-757.000.
Davis, Thomas J.; and Tomeraasen, Paul L., 4,528,506, Cl. 324-225.000.
Gentry, James F., 4,528,660, Cl. 370-80.000.
Simpson, James E., 4,528,549, Cl. 340-347.0AD.
Army: *See—*
Cartier, Francis R.; Stager, David N.; and Acker, Roy M., 4,527,619, Cl. 165-41.000.
Wayne, Robert J.; Henschke, Robert W.; and Mongeon, Robert J., 4,528,668, Cl. 372-26.000.
Energy: *See—*
Cole, Steven W., 4,528,503, Cl. 324-158.00D.
Friedman, Horace A., 4,528,165, Cl. 423-10.000.
Hirschfeld, Tomas B., 4,528,078, Cl. 204-129.000.
Keough, Robert F.; and Meadows, George E., 4,528,032, Cl. 75-66.000.
Health and Human Services: *See—*
Pitt, Colin G., 4,528,196, Cl. 514-533.000.
Ruggera, Paul S.; and Kantor, Gideon, 4,527,550, Cl. 128-1.500.
National Aeronautics and Space Administration: *See—*
Chubb, Donald L., 4,528,417, Cl. 136-253.000.
Edwards, Thomas R., 4,528,639, Cl. 364-723.000.
Fleming, David P., 4,527,910, Cl. 384-99.000.
Poshkus, Algirdas C., 4,528,386, Cl. 549-335.000.
Navy: *See—*
Ayoub, Peter; and Cantor, Alan, 4,527,758, Cl. 244-150.000.
Childers, Carroll D., 4,527,459, Cl. 89-161.000.
Donohue, Terence; and Geosling, Christine E., 4,528,080, Cl. 204-157.10R.
Matthews, William G.; and Whitaker, Todd E., 4,527,749, Cl. 242-7.150.
McManis, George E., III; Miles, Melvin H.; and Fletcher, Aaron N., 4,528,253, Cl. 429-112.000.
Transportation: *See—*
Carp, Gerald, 4,527,480, Cl. 102-202.100.
U.S. Philips Corporation: *See—*
Apeldoorn, Hans J., 4,528,592, Cl. 358-198.000.
Khoe, Giok D., 4,528,695, Cl. 455-612.000.
Kleinhans, Michel; and Gaffre, Michel, 4,528,062, Cl. 156-611.000.
Siemensma, Sidonius V., 4,527,467, Cl. 99-279.000.
Steers, Michel; Hazan, Jean-Pierre; and Courdille, Michel, 4,528,558, Cl. 340-686.000.
te Velde, Ties S.; and Slob, Arie, 4,528,583, Cl. 357-71.000.
Van Deuren, Fransiscus H., 4,527,327, Cl. 29-740.000.

United States Steel Corporation: *See—*
Redwine, Fletcher H.; and Thompson, James E., 4,527,961, Cl. 417-454.000.

United Technologies Automotive, Inc.: *See—*
Floyd, William M.; Webb, Nathaniel; and Juzswik, David L., 4,528,662, Cl. 370-92.000.

United Technologies Corporation: *See—*
Davis, Joseph, 4,527,911, Cl. 384-99.000.
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; Verzella, David J.; and Sivigny, Arthur L., 4,528,628, Cl. 364-424.000.
Gell, Maurice L.; and Giamei, Anthony F., 4,528,048, Cl. 148-404.000.
LaConti, Anthony B.; Enos, John F.; Dempsey, Russell M.; and Fragala, Anthony R., 4,528,083, Cl. 204-265.000.
MacNitt, Donald G., Jr.; and Fuss, Larry N., 4,527,410, Cl. 72-306.000.
Markowski, Stanley J., 4,527,386, Cl. 60-39.360.
Marx, Jon A.; and Loso, Wendell R., 4,527,391, Cl. 60-226.200.

Unitika Ltd.: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Hagiwara, Michiaki; and Yasuhara, Kiyomi, 4,527,614, Cl. 164-463.000.

Universal Instruments Corporation: *See—*
Dean, Weibley J.; Johnson, Charles E.; and Ragard, Phillip A., 4,527,324, Cl. 29-564.600.

Universal International Holdings (USA): *See—*
Jones, Lawrence T.; Lee, R. Stephen; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,527,688, Cl. 206-315.100.

Universal Pioneer Corporation: *See—*
Okano, Takashi, 4,528,599, Cl. 358-328.000.

University of Georgia Research Foundation, Inc.: *See—*
Moon, Nancy J.; Ely, Lane O.; and Sudweeks, E. M., 4,528,199, Cl. 426-53.000.

University of Miami: *See—*
Eckstein, Eugene C.; Block, Norman L.; Kline, Jacob; and Pinchuk, Leonard, 4,527,293, Cl. 623-12.000.

University of TN Research Corporation: *See—*
Stentz, Frankie B.; Wright, Reba K.; and Kitabchi, Abbas E., 4,528,134, Cl. 260-112.700.

University of Virginia Alumni Patents Foundation, The: *See—*
Johnson, Lewis B., 4,528,207, Cl. 427-3.000.

Uno, Hitoshi; Karasawa, Tadahiko; Kon, Tatsuya; and Ito, Tsugutaka, to Dainippon Pharmaceutical Co., Ltd. 1-(2,3-Dimethyl-4-methoxyphenyl)-2-methyl-3-(1-pyrrolidinyl)-1-propanone and anti-spastic use thereof. 4,528,299, Cl. 514-428.000.

UOP Inc.: *See—*
Steacy, Paul C., 4,528,412, Cl. 585-415.000.

Upchurch, Billy T., to GBF, Inc. Oxygen permeable, styrene based, contact lens material. 4,528,301, Cl. 523-107.000.

Upsher, Michael S. Laryngoscope with improved light source. 4,527,553, Cl. 128-11.000.

URACA Pumpenfabrik GmbH & Co. KG: *See—*
Dettinger, Willi; and Fries, Hugo, 4,527,957, Cl. 417-92.000.

Urbanick, Burton A., to Dallas Corporation. Panel edge gasket. 4,527,807, Cl. 277-189.000.

Usami, Tamotsu: *See—*
Shirai, Yuji; Otsuka, Kanji; Usami, Tamotsu; and Yamasaki, Yasuyuki, 4,527,730, Cl. 228-179.000.

USM Corporation: *See—*
Mehta, Pradip S.; and Valsamis, Lefteris N., 4,527,900, Cl. 366-99.000.

Usui, Toshinao: *See—*
Kurono, Masayasu; Yamaguchi, Takuji; and Usui, Toshinao, 4,528,143, Cl. 260-465.00G.

Usuki, Arimitsu: *See—*
Murase, Makoto; and Usuki, Arimitsu, 4,528,122, Cl. 252-518.000.

Utlaut, Mark W.: *See—*
Petric, Paul F.; Foley, Michael S.; Utlaut, Mark W.; and Laiacano, Joseph A., 4,528,451, Cl. 250-441.100.

Uvex Winter Optik GmbH: *See—*
Nussbickl, Walter, 4,527,291, Cl. 2-450.000.

Vail, William B., III, to ParaMagnetic Logging, Inc. Nuclear magnetic resonance method and apparatus for remote detection and volumetric measurement of petroleum reserves. 4,528,508, Cl. 324-303.000.

Vale, Wylie W., Jr.; and Rivier, Jean E. F., to Salk Institute For Biological Studies, The. GRF Analogs IV. 4,528,190, Cl. 514-12.000.

Valenta, Robert J., to Packard Instrument Company, Inc. Method and apparatus for measuring radioactive decay. 4,528,450, Cl. 250-362.000.

Valsamis, Lefteris N.: *See—*
Mehta, Pradip S.; and Valsamis, Lefteris N., 4,527,900, Cl. 366-99.000.

Van Blarcom, David: *See—*
Rubin, Fred K.; Van Blarcom, David; and Fox, Daniel J., 4,528,039, Cl. 134-2.000.

Vandebult, Jan, to I. D. Engineering, Inc. Secure release apparatus for anti-theft fastening device. 4,527,310, Cl. 24-150.00R.

Vanderburg, Ralph W., to Axelson, Inc. In-service test valve. 4,527,770, Cl. 251-26.000.

van der Drift, Johannes K.: *See—*
Henniger, Peter W.; van der Drift, Johannes K.; Kapur, Jagdish C.; and Fasel, Herman P., 4,528,135, Cl. 260-245.20R.

Van der Linde, John: *See—*
Dolan, Richard J.; Cangiano, Frank; and Van der Linde, John, 4,528,619, Cl. 362-61.000.

van der Linde, Robert: *See—*
Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, 4,528,341, Cl. 525-438.000.

Van Deuren, Fransiscus H., to U.S. Philips Corporation. Device for transferring an electric or electronic component to a mounting board. 4,527,327, Cl. 29-740.000.

van Driest, Hans, to NCR Corporation. Automatic gain control. 4,528,519, Cl. 330-279.000.

Van Duyn, Paul D., to General Motors Corporation. Antiglare rear view mirror. 4,527,861, Cl. 350-281.000.

van Hauten, Hartmut, to Black & Decker Inc. Miter saw equipped with means for locking the saw table. 4,527,453, Cl. 83-467.00R.

Varian Associates, Inc.: *See—*
Pedersen, Bjorn O.; and Jost, Jonathan A., 4,527,620, Cl. 165-80.00D.
Petric, Paul F.; Foley, Michael S.; Utlaut, Mark W.; and Laiacano, Joseph A., 4,528,451, Cl. 250-441.100.

Varma, Ravi K.; and Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. 16-Keto-17-substituted thia-17-alkyl(or alkenyl or alkynyl) androstenes. 4,528,138, Cl. 260-397.450.

Vasas, Martin M., to Bridgeport Metal Goods Manufacturing Co., The. Contoured flocked cosmetics brush flexers. 4,527,575, Cl. 132-88.700.

Vazquez, Gonzalo, to AVA International Corporation. Subsurface safety valve. 4,527,631, Cl. 166-322.000.

VDO Adolf Schindling AG: *See—*
Henry, Peter, 4,528,683, Cl. 377-24.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Bottcher, Rolf; Heise, Rolf; and Praxator, Helmut, 4,527,793, Cl. 271-263.000.

Vecchietti, Vittorio; Ferrari, Giorgio; and Casagrande, Cesare, to Simes, Societa Italiana Medicinalle Sintetici. Derivatives of aminopyridinecarboxylic acids and pharmaceutical compositions containing them. 4,528,296, Cl. 514-346.000.

Veit GmbH & Co.: *See—*
Veith, Gustav G.; Schonenberger, Rolf; Thumser, Udo; and Ziegler, Georg, 4,527,484, Cl. 104-89.000.

Veith, Gustav G.; Schonenberger, Rolf; Thumser, Udo; and Ziegler, Georg, to Veit GmbH & Co. Conveyor apparatus, particularly for suspension conveyance. 4,527,484, Cl. 104-89.000.

Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., to Northern Telecom Limited. High density low profile multiple contact connector. 4,527,848, Cl. 339-17.00M.

Vem De Tapas Metalicas, S.A.: *See—*
Prades, Jose F., 4,527,705, Cl. 215-252.000.

Veropa Dkfm. Peter Vogt KG: *See—*
Vogt, Peter; and Hoffelner, Volkwin, 4,527,742, Cl. 239-391.000.

Verson Allsteel Press Company: *See—*
Budrean, John D.; and Kirkpatrick, John A., 4,527,413, Cl. 72-349.000.

Verzella, David J.: *See—*
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; Verzella, David J.; and Sivigny, Arthur L., 4,528,628, Cl. 364-424.000.

Vickery, Donald P. Chimney cleaning method. 4,528,040, Cl. 134-8.000.

Victor Company of Japan, Ltd.: *See—*
Hiraguri, Seisuke, 4,528,605, Cl. 360-77.000.
Koyama, Tsuneyuki, 4,528,604, Cl. 360-74.200.
Moriyama, Masaru; and Sasamura, Kohei, 4,528,601, Cl. 360-46.000.

Vida, Zsuzsa: *See—*
Udvardy Nagy nee Cserey Pechany, Eva; Bartho, Istvan; Hantos, Gabor; Trinn, Maria; Vida, Zsuzsa; Szejtli, Jozsef; Stadler nee Szoke, Agnes; Habon, Ilona; and Balazs nee Czurda, Marta, 4,528,271, Cl. 435-55.000.

Video Turf Incorporated: *See—*
Siekierski, Walter R.; and Sterling, Michael, 4,527,798, Cl. 273-86.00R.

Vineski, John E., to Xerox Corporation. Blade cleaner for a charge-retentive surface. 4,527,887, Cl. 355-15.000.

Visser, Gerald H.: *See—*
Dundas, Richard E.; and Visser, Gerald H., 4,527,708, Cl. 220-18.000.

Vitafin N.V.: *See—*
Rickards, Anthony F., 4,527,568, Cl. 128-419.0PG.

Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, to Czechoslovenska akademia ved. Apparatus for the continuous desublimination of vapors of subliming substances. 4,528,006, Cl. 55-269.000.

Voest-Alpine Aktiengesellschaft: *See—*
Hirschmanner, Franz; and Rom, Ernst, 4,528,434, Cl. 219-10.49A.

Voest-Alpine International Corporation: *See—*
Nugent, Thomas J., 4,527,609, Cl. 164-253.000.

Vogt, Henry P.: *See—*
Qually, Marvin C.; and Vogt, Henry P., 4,527,944, Cl. 414-678.000.

Vogt, Peter; and Hoffelner, Volkwin, to Veropa Dkfm. Peter Vogt KG. Washing appliance. 4,527,742, Cl. 239-391.000.

Vogt, Wilhelm: *See—*
aus der Funten, Helmut; and Vogt, Wilhelm, 4,528,385, Cl. 549-307.000.

Vojnovich, Theodore: *See—*
Blewitt, Donald D.; and Vojnovich, Theodore, 4,528,536, Cl. 337-5.000.

Volk, Joseph A., Jr., to Beta Corporation of St. Louis. Electrical remote control circuit. 4,528,489, Cl. 318-480.000.

Volkswagenwerk AG: *See—*
Seifert, Klaus, 4,527,913, Cl. 384-215.000.

von der Heide, Johann; and Papst, Georg, to Papst Motoren KG. Components for polyphase linear motors. 4,528,466, Cl. 310-12.000.

Voser, Max: *See—*
Prenner, Herbert; Ulrich, Urban; Voser, Max; and Zimmerli, Beat, 4,528,469, Cl. 310-59.000.

Vosteen, Bernhard: *See—*
Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, 4,527,746, Cl. 241-23.000.

VRP Partners, Ltd.: *See—*
Archer, Danny, 4,527,941, Cl. 414-537.000.

Vyzkumny ustav bavinarsky: *See—*
Stejskal, Alois; Havranek, Zdenek; Stepanek, Miroslac; Hrdina, Jan; Cada, Frantisek; Borovcova, Zelmira; and Slingr, Jaroslav, 4,527,384, Cl. 57-404.000.

W. R. Grace & Co.: *See—*
Lovinger, Gerald G.; and Whitehead, Susan A., 4,528,273, Cl. 435-116.000.

Wacker-Chemie GmbH: *See—*
Eck, Herbert; Hannebaum, Manfred; and Kemenater, Christof, 4,528,315, Cl. 524-458.000.
Kreilein, Kurt; Geschonke, Hans; Rummel, Wolfgang; and Wiemer, Hardo, 4,528,337, Cl. 526-70.000.
Schmidhammer, Ludwig; Dummer, Gerhard; Strasser, Rudolf; Haselwarter, Klaus; Klaus, Hermann; and Pichl, Eduard, 4,528,174, Cl. 423-488.000.

Waddill, Harold G., to Texaco Inc. Epoxy resin curatives. 4,528,308, Cl. 523-466.000.

Waddill, Harold G., to Texaco Inc. Weather-resistant epoxy coatings. 4,528,345, Cl. 525-523.000.

Wade, Jack H.: *See—*
Fullbright, Olen E.; Baird, Truette H.; and Wade, Jack H., 4,527,403, Cl. 66-177.000.

Wade, James J., to Riker Laboratories, Inc. Substituted triazolo[1,5-c]pyrimidines. 4,528,288, Cl. 514-258.000.

Waeschle Maschinenfabrik GmbH: *See—*
Krambrock, Wolfgang; and Hoppe, Hans, 4,528,092, Cl. 209-139.00R.

Wagner, Steven D.: *See—*
Trytko, David E.; and Wagner, Steven D., 4,528,598, Cl. 358-314.000.

Waitkus, Phillip A.: *See—*
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,528,349, Cl. 526-262.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,528,373, Cl. 546-66.000.

Wakisaka, Kikuo: *See—*
Kigasawa, Kezuo; Hiiragi, Mineharu; Wakisaka, Kikuo; Ichikawa, Keiko; Nakazato, Kikuo; and Okada, Taiji, 4,528,372, Cl. 544-310.000.

Walbridge, Glenn C. Refuse truck control. 4,527,656, Cl. 180-321.000.

Walch, Hansjorg, to Sulzer Brothers Limited. Control apparatus for a weaving machine. 4,527,598, Cl. 139-435.000.

Waldman, Morton, to Data Bind Inc. Looseleaf binder for computer paper. 4,527,923, Cl. 402-75.000.

Wallace, Frank B., Jr., to Garrett Corporation, The. Jet propulsion apparatus and methods. 4,527,388, Cl. 60-204.000.

Wallat, Siegfried: *See—*
Moller, Hinrich; and Wallat, Siegfried, 4,528,286, Cl. 514-232.000.

Waller, William G., to Tektronix, Inc. Completing a fill pattern inside a redrawn panel outline. 4,528,642, Cl. 364-900.000.

Walter, Horst, to Hoesch Werke Ag. Rotary sheet-metal trimming shear. 4,527,454, Cl. 83-499.000.

Walter, Robert: *See—*
Meier zu Koecker, Heinz; Walter, Robert; and Schmidt, Torsten, 4,528,170, Cl. 423-245.000.

Walther, James F.; and Choi, John I., to Allied Corporation. Production of chromium (III) compounds. 4,528,175, Cl. 423-492.000.

Walton, Eric K., to ACR Process Corp. Automatic control system having manual control engagable at will. 4,527,445, Cl. 74-625.000.

Wang, Ke-Chin: *See—*
Winkelbauer, Howard M.; and Wang, Ke-Chin, 4,528,244, Cl. 428-446.000.

Wang, Martha Y.; Michnowski, Jane; Hnat, Diane L.; and Ross, Robert E., to Nabisco Brands, Inc. Process for making shredded potato products. 4,528,202, Cl. 426-550.000.

Warabi, Junichi: *See—*
Senba, Katsuaki; and Warabi, Junichi, 4,528,432, Cl. 200-144.00B.

Warchol, Joseph F., to E. F. Houghton & Co. Aqueous quenchants containing polyoxazolines and n-vinyl heterocyclic polymers and their use in quenching steel. 4,528,044, Cl. 148-18.000.

Ward, Bennie R.; and Ashton, Richard F., to Reynolds Metals Company. Method for producing superplastic aluminum alloys. 4,528,042, Cl. 148-11.50A.

Ward, John W.: *See—*
Hass, Robert H.; and Ward, John W., 4,528,277, Cl. 502-79.000.

Ward, Raymond E. Symmetrical fluid filter apparatus with multifaceted beads. 4,528,097, Cl. 210-353.000.

Warhurst, Peter: *See—*
Dickinson, John; and Warhurst, Peter, 4,527,338, Cl. 33-180.00R.

Warkentin, John H.: *See—*
Riggins, Oral L.; Mills, Sherry J.; Warkentin, John H.; Stephans, Joseph P.; and Wisdom, Clancy O., 4,528,433, Cl. 200-150.00C.

Warner-Lambert Company: *See—*
Tseo, Gus G.; and Alpen, Mark E., 4,527,588, Cl. 137-565.000.

Warner, Richard D., to Graphic Arts Technical Foundation. Device for indicating a quantitative change in dot area of an image in a printing process and the method of making the same. 4,527,333, Cl. 33-1.00B.

Warrington, Brian H.: *See—*
Coates, William J.; and Warrington, Brian H., 4,528,371, Cl. 544-239.000.

Wasco Products, Inc.: *See—*
Jentoft, Arthur P., 4,527,368, Cl. 52-200.000.

Washizawa, Ichiro: *See—*
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,528,188, Cl. 424-116.000.

Washo, Junichi; Miyazaki, Takaaki; Ishii, Mitsuo; Nakayama, Muneo; Hashimoto, Akira; and Nishimura, Toshihiro, to Sharp Kabushiki Kaisha; and Tokyo Ohka Kogyo Co., Ltd. Electrochromic display device. 4,527,865, Cl. 350-357.000.

Watanabe, Akira: *See—*
Sato, Akihiko; and Watanabe, Akira, 4,527,392, Cl. 60-313.000.

Water Marketers, Inc.: *See—*
Winer, Steven, 4,528,093, Cl. 210-96.200.

Waterton, John C.: *See—*
Radda, George K.; Waterton, John C.; and Gadian, David G., 4,528,509, Cl. 324-309.000.

Watson, John D., Sr.; and Rhodes, Billie B., to Dow Chemical Company, The. Brine saturator method of operation. 4,528,168, Cl. 423-184.000.

Watts, Lewis W., Jr.: *See—*
Sanderson, John R.; and Watts, Lewis W., Jr., 4,528,396, Cl. 560-256.000.

Wayne, Robert J.; Henschke, Robert W.; and Mongeon, Robert J., to United States of America, Army. Programmable multifunction laser. 4,528,668, Cl. 372-26.000.

Weaver, Max A.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Azo dyes from 2-amino-5-cyanomethylthio-1,3,4-thiadiazole and aniline and tetrahydroquinoline couplers. 4,528,368, Cl. 534-768.000.

Webb, Michael J.; and Johnson, David W., to Northern Telecom Limited. Modular telephone jack. 4,527,856, Cl. 339-206.00R.

Webb, Nathaniel: *See—*
Floyd, William M.; Webb, Nathaniel; and Juzswik, David L., 4,528,662, Cl. 370-92.000.

Weber, Franz K., to Modulite Corporation. Audio light chandelier. 4,528,620, Cl. 362-86.000.

Weber, Thomas, to Klockner-Humboldt-Deutz Aktiengesellschaft. Ring-shaped recuperative heat exchanger. 4,527,622, Cl. 165-166.000.

Weetman, Ronald J., to General Signal Corporation. Measurement of fluid forces in mixing apparatus and the control of mixing apparatus in response to fluid forces. 4,527,904, Cl. 366-348.000.

Wegh, John R.: *See—*
Schreiner, Peter; Wegh, John R.; and Smith, Roger L., 4,527,672, Cl. 188-264.00G.

Weiland, Rolf-Juergen: *See—*
Behringer, Wolfgang; Stockl, Klaus; and Weiland, Rolf-Juergen, 4,527,976, Cl. 433-33.000.

Weiss, Edward L.: *See—*
Esterling, Robert J.; Freed, Clarence L.; Weiss, Edward L.; and Korowitz, Simon, 4,528,675, Cl. 375-9.000.

Weiss, Victor H.: *See—*
Rzepecki, Ray M.; and Weiss, Victor H., 4,528,222, Cl. 428-35.000.

Welder, William C., to Raymond Production Systems Corporation. Robot assembly station. 4,527,685, Cl. 198-339.000.

Wella Aktiengesellschaft: *See—*
Lang, Gunther; Wendel, Harald; and Konrad, Eugen, 4,528,283, Cl. 514-55.000.

Wellner, Edward: *See—*
Salzman, Norman; and Wellner, Edward, 4,527,982, Cl. 434-258.000.

Wells, John R., to Wescor, Inc. Pipette controller. 4,527,437, Cl. 73-864.110.

Wendel, Harald: *See—*
Lang, Gunther; Wendel, Harald; and Konrad, Eugen, 4,528,283, Cl. 514-55.000.

Wescor, Inc.: *See—*
Wells, John R., 4,527,437, Cl. 73-864.110.

Wessling, Ritchie A.: *See—*
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., 4,528,384, Cl. 549-78.000.

West Electric Company, Ltd.: *See—*
Shibata, Shunichi, deceased, 4,527,875, Cl. 354-225.000.

Westinghouse Electric Corp.: *See—*
Blewitt, Donald D.; and Vojnovich, Theodore, 4,528,536, Cl. 337-5.000.
Blewitt, Donald D.; and Gupta, Tapan K., 4,528,537, Cl. 337-5.000.
Fikse, Douglas A., 4,527,457, Cl. 89-8.000.
Flick, Robert H.; and Huffman, Walter K., 4,528,531, Cl. 335-23.000.
Greenheck, Donald W.; and Anderson, Lowell M., 4,527,400, Cl. 62-239.000.
Riggins, Oral L.; Mills, Sherry J.; Warkentin, John H.; Stephans, Joseph P.; and Wisdom, Clancy O., 4,528,433, Cl. 200-150.00C.
Shariff, Sadiq A.; Bharteey, Brij M.; and Mehkri, Shahab A., 4,528,614, Cl. 361-379.000.
Silvestri, George J., Jr., 4,527,396, Cl. 60-685.000.
Smith, Yoav M., 4,528,637, Cl. 364-557.000.
Stol, Israel, 4,528,436, Cl. 219-74.000.
Tobery, Edward W.; and Parker, Stephen R., 4,527,397, Cl. 60-757.000.
Udren, Eric A., 4,528,611, Cl. 361-81.000.

Udren, Eric A., 4,528,678, Cl. 375-104.000.

Westwood, William D.: *See—*
Poulsen, Robert G.; Smith, Gerald M.; and Westwood, William D., 4,528,438, Cl. 219-121.0PE.

Weyerhaeuser Company: *See—*
Brock, Gregory K.; and Knowlen, Bruce R., 4,528,651, Cl. 367-99.000.

Wheeler, Edward L.: *See—*
Gencarelli, Richard A.; and Wheeler, Edward L., 4,528,381, Cl. 548-257.000.

Whisenhunt, Jackie W.: *See—*
Goodwin, Anton E.; Marton, Janet L.; Owens, Robert M.; Whisenhunt, Jackie W.; and Swain, Roy D., 4,528,162, Cl. 422-101.000.

Whitaker, Todd E.: *See—*
Matthews, William G.; and Whitaker, Todd E., 4,527,749, Cl. 242-7.150.

White, Francis R.: *See—*
Geipel, Henry J., Jr.; Schaefer, Charles A.; White, Francis R.; and Wursthorn, John M., 4,527,325, Cl. 29-571.000.

White, Jack M., to Babcock & Wilcox Company, The. Cylindrical force transducer beam. 4,527,434, Cl. 73-867.650.

White River Technologies, Inc.: *See—*
Bowman, Harold L., 4,527,714, Cl. 222-56.000.

White, Robert N.: *See—*
Uffner, William E.; and White, Robert N., 4,528,241, Cl. 428-378.000.

Whitehead, Susan A.: *See—*
Lovinger, Gerald G.; and Whitehead, Susan A., 4,528,273, Cl. 435-116.000.

Whiteman Manufacturing Company: *See—*
Whiteman, Marvin E., 4,527,959, Cl. 417-342.000.

Whiteman, Marvin E., to Whiteman Manufacturing Company. Drilling fluid pump providing a uniform, controlled pressure and flow rate. 4,527,959, Cl. 417-342.000.

Whiteside, George D.; Keith, Laura E.; and Pizzuti, Donato F., to Polaroid Corporation. Exposure control system for photographic camera apparatus. 4,527,888, Cl. 354-400.000.

Whiteside, Ross C., Jr.: *See—*
Berman, Jody R.; Bertram, James L.; and Whiteside, Ross C., Jr., 4,528,359, Cl. 528-109.000.

Whitley, Oran D.; and Poque, James B. Pressure differential circulating valve. 4,527,629, Cl. 166-321.000.

Whittam, Thomas V.: *See—*
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,528,171, Cl. 423-277.000.

Wichelhaus, Winfried; and Schroder, Christine, to Henkel Kommanditgesellschaft auf Aktien. Hollow spherical bodies of solidified alkali metal silicate. 4,528,149, Cl. 264-13.000.

Wichman, Francis H.: *See—*
Eggeman, Vincent A.; Bubb, Jerome D.; Siegel, Harvey R.; and Wichman, Francis H., 4,527,684, Cl. 192-130.000.

Wichman, William J.: *See—*
Gunzel, Rudolph M., Jr.; Wichman, William J.; and Fujitaki, Roy K., 4,527,740, Cl. 239-318.000.

Wiegel, Roger E., to Rockwell International Corporation. Battery backup power switch. 4,528,459, Cl. 307-66.000.

Wiemer, Hardo: *See—*
Kreilein, Kurt; Geschonke, Hans; Rummel, Wolfgang; and Wiemer, Hardo, 4,528,337, Cl. 526-70.000.

Wilcock, Donald F.; and Gray, Stanley, to Mechanical Technology Incorporated. Integral magnetic fluid centrifugal high speed gas seal and method. 4,527,802, Cl. 277-1.000.

Wild, Ernst: *See—*
Daumer, Rolf; Feldmann, Ekkehard; Person, Martin; Wild, Ernst; and Zechnall, Martin, 4,527,523, Cl. 123-419.000.

Wild, Gene M., to Eli Lilly and Company. 20-Dihydro-20-deoxy-23-de(mycinosyloxy)tylosin. 4,528,369, Cl. 536-7.100.

Wilkerson, Larry A.: *See—*
McMains, Kevin W.; and Wilkerson, Larry A., 4,527,832, Cl. 297-355.000.

Wilkinson, Brian S.: *See—*
Ede, Douglas F. C.; Wilkinson, Brian S.; and Mynott, Colin B., 4,527,605, Cl. 144-286.00R.

Williams, Arlene G., to General Electric Company. Organoaluminosiloxane coating compositions and coated substrate. 4,528,038, Cl. 106-287.130.

Williams, Joy L.: *See—*
Haas, Louis M.; Williams, Joy L.; and Smith, Boyd E., 4,527,716, Cl. 222-83.500.

Williams, Paul: *See—*
Domin, Thomas M.; Landis, Dan R.; and Williams, Paul, 4,528,507, Cl. 324-229.000.

Willmore, James A.; and Miszkiewicz, Henry L., to Opto Systems Incorporated. Head for optical card reader. 4,528,445, Cl. 235-469.000.

Wilson, Douglas, to British Petroleum Company p.l.c., The. Epoxy resin compositions. 4,528,342, Cl. 525-463.000.

Wilson, Marlin G.: *See—*
Braginetz, Paul A., 4,527,375, Cl. 52-712.000.

Wilson, Ronald: *See—*
Young, Donald A.; and Wilson, Ronald, 4,528,470, Cl. 310-78.000.

Winchester Disc, Inc.: *See—*
Lawrence, John E.; and Barnes, Lloyd L., Jr., 4,528,063, Cl. 156-626.000.

Windmoller & Holscher: *See—*
Lubke, Herbert; and Stascheit, Winfried, 4,527,474, Cl. 101-247.000.

Winer, Steven, to Water Marketers, Inc. Method and apparatus for purifying and dispensing water. 4,528,093, Cl. 210-96.200.

Winkelbauer, Howard M.; and Wang, Ke-Chin, to Dresser Industries, Inc. Fused silica shapes. 4,528,244, Cl. 428-446.000.

Wisdom, Clancy O.: *See—*
Riggins, Oral L.; Mills, Sherry J.; Warkentin, John H.; Stephans, Joseph P.; and Wisdom, Clancy O., 4,528,433, Cl. 200-150.00C.

Witkowski, Joseph T.; and Sunday, Brooks R., to Schering Corporation. 2-(4'-Pyridinyl)-thiazole compounds and their use in increasing cardiac contractility. 4,528,291, Cl. 514-301.000.

Wittenberger, John C.: *See—*
Dunaway, Thomas J.; Spielberger, Richard K.; and Wittenberger, John C., 4,528,446, Cl. 250-216.000.

Wittkower, Andrew B.: *See—*
Hirvonen, James K.; Wittkower, Andrew B.; and Denholm, A. Stuart, 4,528,208, Cl. 427-35.000.

Wojskowa Akademia Techniczna Im.: *See—*
Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, 4,528,116, Cl. 252-299.630.

Wolf, James F.; Savner, Suzanne M.; Maxfield, MacRae; and Shacklette, Lawrence W., to Allied Corporation. Conjugated polymer battery containing organosulfur solvent. 4,528,254, Cl. 429-197.000.

Wolf, Karlheinz: *See—*
Molls, Hans-Heinz; Kaspar, Vaclav; Vosteen, Bernhard; Dehmel, Georg; Hornle, Reinhold; and Wolf, Karlheinz, 4,527,746, Cl. 241-23.000.

Wolf, Peter H.; Clarke, David C.; and Hieber, Heinz H., to Dataproducts Corporation. Dot matrix print actuator. 4,527,469, Cl. 101-93.040.

Wolf, Rodney A.; and Zech, Alan G., to Kimberly Hills, Ltd. High insulating solar block structures. 4,527,544, Cl. 126-419.000.

Wolff, Gunter: *See—*
Eckstein, Wolfgang; Leichnitz, Kurt; Pannwitz, Karl-Heinz; Rabenecker, Horst; and Wolff, Gunter, 4,528,160, Cl. 422-86.000.

Wolff, Konrad: *See—*
Hofmann, Hansdieter; Rothe, Hans-Jochen; Skupin, Georg; and Wolff, Konrad, 4,528,362, Cl. 528-336.000.

Woloszczuk, Edmund W., to Marconi Company Limited, The. Slotted dipole with three layer transmission line feed. 4,528,568, Cl. 343-816.000.

Wong, David T.; and Foreman, Mark M., to Eli Lilly and Company. Stimulating dopamine D-1 receptors. 4,528,290, Cl. 514-293.000.

Woo, Edmund P.; and Dellar, David V., to Dow Chemical Company, The. Production of polytriazines from aromatic polycyanates with cobalt salt of a carboxylic acid as catalyst. 4,528,366, Cl. 528-422.000.

Wood, Edward T.; and Sodich, Ernest O., to Completion Tool Company. Packer valve arrangement. 4,527,625, Cl. 166-187.000.

Wood, Godfrey A.: *See—*
Arther, Hugh M.; Preston, Edward G.; Stewart, David B.; and Wood, Godfrey A., 4,528,050, Cl. 156-62.400.

Wood, Kenneth W.: *See—*
Bolt, William S.; and Wood, Kenneth W., 4,527,694, Cl. 211-46.000.

Woodard, Kenneth E., Jr.: *See—*
Fair, David L.; Justice, David D.; and Woodard, Kenneth E., Jr., 4,528,077, Cl. 204-95.000.

Woytowich, Nicholas. Detachable tool and paint can platform for ladder. 4,527,763, Cl. 248-238.000.

Wriegt, Jurgen: *See—*
Baatz, Henning; Ritsscher, Dieter; and Wriegt, Jurgen, 4,528,454, Cl. 250-506.100.

Wright, Reba K.: *See—*
Stentz, Frankie B.; Wright, Reba K.; and Kitabchi, Abbas E., 4,528,134, Cl. 260-112.700.

Wright, Stuart C.: *See—*
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; Verzella, David J.; and Sivigny, Arthur L., 4,528,628, Cl. 364-424.000.

Wrobleski, James T., to Monsanto Company. Process for preparing phosphorus-vanadium mixed oxide catalysts. 4,528,280, Cl. 502-209.000.

Wulfing, James J.: *See—*
Rood, Robert M.; and Wulfing, James J., 4,527,755, Cl. 242-199.000.

Wursthorn, John M.: *See—*
Geipel, Henry J., Jr.; Schaefer, Charles A.; White, Francis R.; and Wursthorn, John M., 4,527,325, Cl. 29-571.000.

Wusthof, Peter: *See—*
Eisenbacher, Egon; Cunningham, Sinclair; Wusthof, Peter; and Cunningham, Sinclair, 4,527,460, Cl. 91-491.000.

Xerox Corporation: *See—*
Dir, Gary A., 4,527,864, Cl. 350-337.000.
Kadekodi, Narayan K.; Shey-Ping, Larry S.; and Ibrahim, Abd-El-Fattah A., 4,528,594, Cl. 358-213.000.
Vineski, John E., 4,527,887, Cl. 355-15.000.

Xomox Corporation: *See—*
Stogner, Clarence H.; and Koerner, David J., 4,527,769, Cl. 251-14.000.

Yagi, Hideki: *See—*
Tanaka, Yoshimasa; Uchino, Minoru; Yagi, Hideki; Teshima, Iwao; and Matsuki, Kensei, 4,528,045, Cl. 148-35.000.

Yagi, Noriyuki: *See—*
Itoh, Yasuo; Kato, Hideo; Ogawa, Nobuo; Koshinaka, Eiichi; Suzuki, Tomio; and Yagi, Noriyuki, 4,528,287, Cl. 514-254.000.

Yamada, Akira: *See*—
Beard, Charles D.; Yamada, Akira; and Doddi, Namassivaya, 4,528,311, Cl. 524-91.000.
Yamada, Kazuji: *See*—
Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; Kobori, Shigeyuki; and Nishihara, Motohisa, 4,527,428, Cl. 73-721.000.
Yamada, Keiichi: *See*—
Ozone, Takashi; Hayakawa, Shohei; Nakajima, Fusao; Yamada, Keiichi; and Araki, Kazuo, 4,527,356, Cl. 51-101.00R.
Yamada, Muneki; and Sakamoto, Akira, to Toyo Seikan Kaisha, Ltd. Multi-layer plastic laminate structure. 4,528,219, Cl. 428-35.000.
Yamaguchi, Kazuo: *See*—
Nakahata, Kozo; Kawaguchi, Ikuo; and Yamaguchi, Kazuo, 4,528,634, Cl. 364-491.000.
Yamaguchi, Masanori; Tsutsumi, Yasuyuki; Nogita, Shunsuke; Shimada, Kazunari; and Maruko, Saburo, to Hitachi, Ltd.; and Nippon Chemicl Plant Consultant Co., Ltd. Differential-pressure control device for a fuel cell. 4,528,251, Cl. 429-25.000.
Yamaguchi, Takuji: *See*—
Kurono, Masayasu; Yamaguchi, Takuji; and Usui, Toshinao, 4,528,143, Cl. 260-465.00G.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Katsuoka, Tatsuzo, 4,527,831, Cl. 297-243.000.
Nakahama, Ryoji, 4,527,441, Cl. 74-378.000.
Yamamoto, Kenji: *See*—
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.
Yamamoto, Sadahiro; and Ouchi, Chiaki, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing austenitic stainless steel plates. 4,528,046, Cl. 148-12.00E.
Yamamoto, Takemi; and Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Apparatus for both printing characters and plotting graphs. 4,527,918, Cl. 400-82.000.
Yamane, Satoshi; and Suzuki, Toshitatsu, to Ricoh Co., Ltd. Distance measuring apparatus. 4,527,892, Cl. 356-1.000.
Yamasaki, Yasuyuki: *See*—
Shirai, Yuji; Otsuka, Kanji; Usami, Tamotsu; and Yamasaki, Yasuyuki, 4,527,730, Cl. 228-179.000.
Yamashita, Mirsuo: *See*—
Kurosawa, Keiji; Yamamoto, Kenji; Yamashita, Mirsuo; Mitsui, Hisami; Miyabara, Ayako; Miyagawa, Kiyotaka; and Imura, Takayoshi, 4,528,072, Cl. 204-15.000.
Yamato Scale Company, Limited: *See*—
Hirano, Takashi, 4,527,646, Cl. 177-25.000.
Yamazaki Machinery Works, Ltd.: *See*—
Sakai, Takayoshi; Sano, Shinji; and Matsumoto, Koji, 4,528,633, Cl. 364-474.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device and its manufacturing method. 4,528,065, Cl. 156-643.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Light energy conversion system. 4,528,252, Cl. 429-111.000.
Yano Giken Co., Ltd.: *See*—
Yano, Masatoshi; and Hamamoto, Kiyoshi, 4,527,586, Cl. 137-318.000.
Yano, Kazuya: *See*—
Namba, Kazuya; Yano, Kazuya; Nakazima, Hirosi; and Muraki, Yu, 4,527,699, Cl. 215-1.00C.
Yano, Masatoshi; and Hamamoto, Kiyoshi, to Yano Giken Co., Ltd. Structural kit for the installation of a flow regulator valve. 4,527,586, Cl. 137-318.000.
Yasuhara, Kiyomi: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Hagiwara, Michiaki; and Yasuhara, Kiyomi, 4,527,614, Cl. 164-463.000.
Yasui, Sosuke: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,528,188, Cl. 424-116.000.
Yasukawa, Makoto; and Ishii, Kenji, to Cerberus AG; and Nohmi Bosai Kogyo Co. Ltd. Light extinction smoke detector. 4,528,555, Cl. 340-630.000.
Yeary, Arthur R. Butterfly valve protector. 4,527,771, Cl. 251-118.000.
Yeda Research & Development Company, Ltd.: *See*—
Fischler, Henryk; Krupka, Yaakov; and Behar, Salamon, 4,527,567, Cl. 128-419.0PT.
Yeh, Chuen Y.; and Savini, Charles, to Exxon Research & Engineering Co. Catalytic process for the manufacture of ketones. 4,528,401, Cl. 568-408.000.
Yoell, Richard W.: *See*—
Harris, Peter; and Yoell, Richard W., 4,528,203, Cl. 426-555.000.
Yokogawa, Tetsuya; Futami, Ryuhei; and Kawahara, Saburo, to Kanagawa Prefectural Government, The. Method of recovering volatile organic matters. 4,528,001, Cl. 55-37.000.
Yoneyama, Tomio: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,528,113, Cl. 252-299.100.
Yoshida, Bunsaku: *See*—
Sato, Atsushige; Miura, Ishi; Kumei, Yasuhiro; Okuno, Osamu; Nakano, Tsuyoshi; and Yoshida, Bunsaku, 4,528,034, Cl. 75-255.000.
Yoshida, Kaichiro; and Ueda, Yutaka, to Murata Kikai Kabushiki Kaisha. Dobby. 4,527,597, Cl. 139-68.000.
Yoshida, Kenji; and Sanada, Yuichi, to Nissan Motor Company, Limited. Cylinder apparatus for rack and pinion type power steering mechanism of motor vehicle. 4,527,465, Cl. 92-136.000.
Yoshida, Yasuharu, to NEC Corporation. Timing synchronizing circuit for demodulators. 4,528,512, Cl. 329-50.000.
Yoshie, Atsuyoshi; and Karasawa, Hiroyuki, to Toyo Tire & Rubber Co., Ltd. Process for making a radial tire. 4,528,052, Cl. 156-117.000.
Yoshihisa, Kanazawa: *See*—
Shigehiro, Koga; Yoshihisa, Kanazawa; Takeshi, Okamoto; Masafumi, Yamanouchi; and Kazumichi, Shudo, 4,528,306, Cl. 523-219.000.
Yoshikawa, Yukio: *See*—
Kurosu, Tomio; and Yoshikawa, Yukio, 4,527,877, Cl. 354-234.100.
Yoshimoto, Seiichi: *See*—
Tarumi, Niro; Okubo, Yoichi; and Yoshimoto, Seiichi, 4,528,351, Cl. 526-314.000.
Yoshimura, Tokuo; Hagiwara, Kunio; and Aiba, Akira, to Nippon Steel Chemical Co., Ltd. Polyamide resin composition. 4,528,304, Cl. 523-216.000.
Yoshimura, Yoshikane: *See*—
Kondo, Hiroyuki; Yoshimura, Yoshikane; and Nomura, Yoshihisa, 4,527,709, Cl. 220-22.000.
Yoshino, Atsuhiko: *See*—
Matsuo, Yoshiho; Nishijima, Ryoji; Yoshino, Atsuhiko; and Kawashima, Takai, 4,528,151, Cl. 264-83.000.
Yoshioka, Junichi: *See*—
Miyashita, Masakazu; Kanai, Akira; Yoshioka, Junichi; Koizumi, Koichi; Hashimoto, Fukuo; Daito, Michimasa; and Hasebe, Takashi, 4,528,074, Cl. 204-16.000.
Yoshioka, Kimitomo: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,528,188, Cl. 424-116.000.
Yoshioka, Mamoru: *See*—
Suzuki, Makoto; Takimoto, Toshiyuki; Yoshioka, Mamoru; and Masui, Takatoshi, 4,527,529, Cl. 123-478.000.
Yoshioka, Takeo: *See*—
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,528,397, Cl. 514-400.000.
Yoshizawa, Toshikazu; and Fujita, Takafumi, to Bridgestone Tire Co., Ltd. Earthquake insulating bearing assembly. 4,527,365, Cl. 52-67.000.
Yost, Marvin E.: *See*—
Cantu, Lisa A.; Yost, Marvin E.; Coffee, Robert L.; and Stolhand, James E., 4,527,626, Cl. 166-275.000.
Young, Donald A.; and Wilson, Ronald, to Lucas Industries. Starter motor incorporating an epicyclic reduction gear mechanism. 4,528,470, Cl. 310-78.000.
Young, John E. G., to General Signal Corporation. Control device for a hydrostatic transmission. 4,527,393, Cl. 60-327.000.
Young, Robert E.: *See*—
Bridgewater, Bobbie D.; and Young, Robert E., 4,527,986, Cl. 464-73.000.
Yu, Ho; and Ai, Daniel K., to Aluminum Company of America. Roll caster apparatus having nozzle tip assembly with improved molten metal flow conditions. 4,527,612, Cl. 164-428.000.
Yuasa, Masaharu: *See*—
Kasai, Yoshiaki; Hiraoka, Yasuo; Yuasa, Masaharu; Harada, Masataka; and Saito, Masao, 4,527,532, Cl. 123-520.000.
Yuhasz, Kathleen M.: *See*—
Curtis, John P.; Crawford, Richard J.; and Yuhasz, Kathleen M., 4,528,182, Cl. 424-54.000.
Yumoto, Satoshi: *See*—
Fukuda, Takeshi; and Yumoto, Satoshi, 4,528,156, Cl. 264-236.000.
Zackrisson, Barry L., to Dana Corporation. Driveshaft. 4,527,978, Cl. 464-183.000.
Zahn, Christian, to Schuberth-Werk GmbH & Co. KG. Internal structure for a protective helmet. 4,527,290, Cl. 2-416.000.
Zamachaj, Richard A.: *See*—
Desilets, Norman H.; Gazda, Chester T.; and Zamachaj, Richard A., 4,527,819, Cl. 285-287.000.
Zanelli, Claudio I.: *See*—
Horner, Michael S.; Brisken, Axel F.; and Zanelli, Claudio I., 4,528,652, Cl. 367-162.000.
Zarchy, Andrew S., to General Electric Company. Process for producing high yield of gas turbine fuel from residual oil. 4,528,100, Cl. 210-634.000.
Zech, Alan G.: *See*—
Wolf, Rodney A.; and Zech, Alan G., 4,527,544, Cl. 126-419.000.
Zechnall, Martin: *See*—
Daumer, Rolf; Feldmann, Ekkehard; Person, Martin; Wild, Ernst; and Zechnall, Martin, 4,527,523, Cl. 123-419.000.
Zellweger Uster Ltd.: *See*—
Goede, Simon; Hauser, Peter; and Mira, Silvio, 4,527,894, Cl. 356-28.000.
Zenith Electronics Corporation: *See*—
Citta, Richard W., 4,528,663, Cl. 370-94.000.
Zenyaku Kogyo Kabushiki Kaisha: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,528,188, Cl. 424-116.000.
Zeon Kasei Co., Ltd.: *See*—
Numakami, Hajime; and Kuroda, Hideyuki, 4,527,355, Cl. 49-82.000.
Zeroni, Ludwig: *See*—
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,527,691, Cl. 206-387.000.
Ziegler, Georg: *See*—
Veith, Gustav G.; Schonenberger, Rolf; Thumser, Udo; and Ziegler, Georg, 4,527,484, Cl. 104-89.000.

Ziegler, James F.: *See*—
Cairns, James A.; and Ziegler, James F., 4,528,212, Cl. 427-96.000.
Zielinski, Jerzy: *See*—
Dabrowski, Roman; Dziaduszek, Jerzy; Szczucinski, Tomasz; Stolarz, Zofia; Zielinski, Jerzy; and Kenig, Krystyna, 4,528,116, Cl. 252-299.630.
Zimmer, Stanley F.: *See*—
Howlett, Donald L.; Meyer, Herbert J.; and Zimmer, Stanley F., 4,528,650, Cl. 367-79.000.
Zimmerli, Beat: *See*—
Prenner, Herbert; Ulrich, Urban; Voser, Max; and Zimmerli, Beat, 4,528,469, Cl. 310-59.000.
Zimmerman, Luther L.: *See*—
Pearson, Kenneth A.; and Zimmerman, Luther L., 4,528,693, Cl. 382-47.000.
Zink, John S. Tethered swimmer's tank. 4,527,795, Cl. 272-71.000.
Zoschg, James R.; and Lisac, Gary E. Fowl call; silencer. 4,527,985, Cl. 446-397.000.
Zucker, Udo: *See*—
Honig, Gunter; Kaiser, Gunther; Lotterbach, Gerhard; and Zucker, Udo, 4,527,422, Cl. 73-117.300.
Zweigle, Maurice L.: *See*—
Alderman, Daniel A.; and Zweigle, Maurice L., 4,528,125, Cl. 252-522.00A.
Zymet, Inc.: *See*—
Hirvonen, James K.; Wittkower, Andrew B.; and Denholm, A. Stuart, 4,528,208, Cl. 427-35.000.
Zyngier, John F., to General Motors Corporation. Adjustable headrest. 4,527,834, Cl. 297-410.000.
501 Nitto Boseki, Co. Ltd: *See*—
Harada, Susumu; and Shimizu, Kiyoshi, 4,528,347, Cl. 526-219.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JULY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Auth, Gerald L., to Gerber Scientific Instrument Company, The. Multiplex interferometer. Re. 31,941, Cl. 356-346.000.

Chesley F. Carlson Company: *See*—
Klukow, Roger, Re. 31,938, Cl. 72-387.000.

Gerber Scientific Instrument Company, The: *See*—
Auth, Gerald L., Re. 31,941, Cl. 356-346.000.

Klehm, William G., Jr. High speed serial scan and readout of keyboards. Re. 31,942, Cl. 340-365.00E.

Klukow, Roger, to Chesley F. Carlson Company. Web bending fixture. Re. 31,938, Cl. 72-387.000.

Marting Mfg. Inc.: *See*—
Van Dusseldorp, Larry R., Re. 31,939, Cl. 119-53.500.

Ready, Patrick J., to Typologics, Inc. Multichannel coherent receiver. Re. 31,943, Cl. 455-226.000.

Ritchey, Eugene B. Identification tag for livestock. Re. 31,940, Cl. 119-156.000.

Typologics, Inc.: *See*—
Ready, Patrick J., Re. 31,943, Cl. 455-226.000.

Van Dusseldorp, Larry R., to Marting Mfg. Inc. Animal feeder. Re. 31,939, Cl. 119-53.500.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Barkhau, Ray W.: *See*—
Cassidy, Don; and Barkhau, Ray W., B1 3,883,334, Cl. 65-2.000.

Cassidy, Don; and Barkhau, Ray W., to L. C. Cassidy & Son, Inc. Mineral fiber production method and apparatus. B1 3,883,334, 7-9-85, Cl. 65-2.000.

Cox, John A.: *See*—
Esty, Janet M.; and Cox, John A., B1 4,166,465, Cl. 128-303.130.

Esty, Janet M.; and Cox, John A., to Neomed Incorporated. Electrosurgical dispersive electrode. B1 4,166,465, 7-9-85, Cl. 128-303.130.

Featherstone, John L.: *See*—
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Allen, James H., 279,525, Cl. D3-71.000.
United States Borax & Chemical Corporation: *See—*
vonBuelow, John, 279,530, Cl. D6-545.000.
U. S. Metal Container Company: *See—*
Elmburg, John R., 279,549, Cl. D9-376.000.
Vergneau, Gerard: *See—*
Menei, Laurent; and Vergneau, Gerard, 279,563, Cl. D14-54.000.
Vitalmetrics, Inc.: *See—*
Blankenship, Larry K., 279,605, Cl. D24-59.000.
vonBuelow, John, to United States Borax & Chemical Corporation. Soap dispenser. 279,530, 7-9-85, Cl. D6-545.000.
Walker, Thomas. Tool box. 279,618, 7-9-85, Cl. D34-44.000.
Whiteside, George D.: *See—*
Conner, James M.; Costa, Peter F.; Ryan, James M; and Whiteside, George D., 279,574, Cl. D16-5.000.
Wood, Ronald. Digital telephone exchange equipment cabinet or similar article. 279,562, 7-9-85, Cl. D14-52.000.
Yasuoka, Hirotoshi; and Fujimoto, Takanobu, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot. 279,572, 7-9-85, Cl. D15-199.000.
Yavorsky, Illary A.: *See—*
Pashkov, Anatoly P.; Kipernik, Efim G.; Onischenko, Anatoly V.; Sakharov, Valentin S.; Kudryashev, Mikhail M.; Karpov, Oleg P.; Yavorsky, Illary A.; and Gizer, Boris V., 279,543, Cl. D8-30.000.
Zucker, Frank. Detachable carrier for picnic plates, cups and accessories. 279,521, 7-9-85, Cl. D3-30.100.
24 Hour Postal Center, Inc.: *See—*
Stevens, Max L.; and Goeckeler, William P., 279,619, Cl. D99-29.000.

LIST OF PLANT PATENTEES

B. V. Handelskwekerij: *See*—
van Andel, Jacob, 5,509, Cl. 68.000.
van Andel, Jacob, 5,510, Cl. 68.000.

Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de la Londe SCS Barberet & Ducloux. Carnation named Londeton. 5,511, 7-9-85, Cl. 71.000.

Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de la Londe SCS Barberet and Ducloux. Carnation named Lonpilem. 5,512, 7-9-85, Cl. 71.000.

Chick, Norman A., to Glazier, James L. Apple tree. 5,508, 7-9-85, Cl. 34.000.

Ducloux, Yves: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,511, Cl. 71.000.
Barberet, Nicole; and Ducloux, Yves, 5,512, Cl. 71.000.

Glazier, James L.: *See*—
Chick, Norman A., 5,508, Cl. 34.000.

Laboratoire de Physiologie Vegetale de la Londe SCS Barberet & Ducloux: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,511, Cl. 71.000.
Barberet, Nicole; and Ducloux, Yves, 5,512, Cl. 71.000.

M. C. Staaveren: *See*—
van Andel, Jacob, 5,510, Cl. 68.000.

M. C. van Staaveren: *See*—
van Andel, Jacob, 5,509, Cl. 68.000.

van Andel, Jacob, to B. V. Handelskwekerij; and M. C. van Staaveren. Alstroemeria named Stalpatri. 5,509, 7-9-85, Cl. 68.000.

van Andel, Jacob, to B. V. Handelskwekerij; and M. C. Staaveren. Alstroemeria named Stalpas. 5,510, 7-9-85, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 9, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

19	4,527,287
48	4,527,288
322	4,527,289
416	4,527,290
450	4,527,291
452	4,527,292

CLASS 4

321	4,527,295
324	4,527,296
496	4,527,297

CLASS 5

66	4,527,298

CLASS 8

94.21	4,527,992
471	4,527,993
494	4,527,994

CLASS 10

152 R	4,527,299

CLASS 15

21 C	4,527,300
250 B	4,527,301
325	4,527,302

CLASS 16

86 B	4,527,303

CLASS 17

11	4,527,304
11.3	4,527,305

CLASS 19

66 CC	4,527,306
105	4,527,307

CLASS 24

30.5 R	4,527,308
68 CD	4,527,309
150 R	4,527,310
303	4,527,311
453	4,527,312
464	4,527,313
587	4,527,314
615	4,527,315
616	4,527,316
641	4,527,317

CLASS 29

25.42	4,527,318
33 R	4,527,320
	4,527,321
33 T	4,527,319
402.06	4,527,322
451	4,527,323
564.6	4,527,324
571	4,527,325
705	4,527,326
740	4,527,327
749	4,527,328
825	4,527,329
827	4,527,330

CLASS 30

135	4,527,331
234	4,527,332

CLASS 33

1 B	4,527,333
138	4,527,334
147 D	4,527,335
172 R	4,527,336
180 R	4,527,338
293	4,527,339
430	4,527,340
455	4,527,341
562	4,527,337

CLASS 34

10	4,527,342
16	4,527,343

CLASS 36

126	4,527,344
127	4,527,345

CLASS 38

144	4,527,346

CLASS 40

361	4,527,347

CLASS 42

76 R	4,527,348

CLASS 43

21.2	4,527,349
55	4,527,350

CLASS 44

56	4,527,995
72	4,527,996

CLASS 47

58	4,527,352
59	4,527,353
81	4,527,354

CLASS 48

86 R	4,527,997

CLASS 49

82	4,527,355

CLASS 51

101 R	4,527,356
105 SP	4,527,357
131.3	4,527,358
138	4,527,359
170 TL	4,527,360
239	4,527,361
309	4,527,998

CLASS 52

67	4,527,365
71	4,527,362
122.1	4,527,363
127.7	4,527,364
184	4,527,366
187	4,527,367
200	4,527,368
211	4,527,369
282	4,527,370
309.16	4,527,371
334	4,527,372
405	4,527,373
557	4,527,374
712	4,527,375

CLASS 53

113	4,527,376
167	4,527,377
266 A	4,527,378
589	4,527,379

CLASS 55

2 G	4,528,000
16	4,527,999
37	4,528,001
48	4,528,002
158	4,528,003
	4,528,004
178	4,528,005
269	4,528,006
395	4,528,007
485	4,528,008

CLASS 56

12.8	4,527,380
209	4,527,381
295	4,527,382

CLASS 57

200	4,527,383
404	4,527,384

CLASS 60

39.07	4,527,385
39.092	4,527,387
39.36	4,527,386
204	4,527,388
207	4,527,389
224	4,527,390
226.2	4,527,391
313	4,527,392
327	4,527,393
517	4,527,394
562	4,527,395
641.5	B1 4,428,200
685	4,527,396
757	4,527,397

CLASS 62

94	4,527,398
212	4,527,399
239	4,527,400
354	4,527,401

CLASS 65

2	B1 3,883,334
3.12	4,528,009
18.1	4,528,010
30.13	4,528,011
135	4,528,012
136	4,528,013
142	4,528,014
162	4,528,015
163	4,528,016
240	4,528,017
260	4,528,018

CLASS 66

55	4,527,402
177	4,527,403
202	4,527,404

CLASS 70

14	4,527,405
165	4,527,406
167	4,527,407

CLASS 71

15	4,528,019
28	4,528,020
41	4,528,021
73	4,528,022
86	4,528,023
92	4,528,024
	4,528,025
	4,528,026
93	4,528,027
113	4,528,028

CLASS 72

201	4,527,408
202	4,527,409
306	4,527,410
340	4,527,411
349	4,527,412
	4,527,413
387	Re.31,938
402	4,527,414

CLASS 73

4 R	4,527,415
11	4,527,416
23	4,527,417
30	4,527,418
40.5 A	4,527,419
61 R	4,527,420
64.4	4,527,421
117.3	4,527,422
118	4,527,423
119 A	4,527,424
155	4,527,425
158	4,527,426
204	4,527,427
721	4,527,428
744	4,527,429
745	4,527,430
803	4,527,431
861.28	4,527,432
	4,527,433
863.03	4,527,435
863.84	4,527,436
864.11	4,527,437
864.81	4,527,438
867.65	4,527,434

CLASS 74

5.43	4,527,439
10 R	4,527,440
378	4,527,441
411.5	4,527,442
417	4,527,443
493	4,527,444
625	4,527,445
828	4,527,446
866	4,527,447
869	4,527,448

CLASS 75

3	4,528,029
35	4,528,030
53	4,528,031
66	4,528,032
73	4,528,033
255	4,528,034
257	4,528,035

CLASS 76

108 R	4,527,449

CLASS 81

3.29	4,527,450
9.51	4,527,451

CLASS 83

209	4,527,452
467 R	4,527,453
499	4,527,454
588	4,527,455

CLASS 84

1.04	4,527,456

CLASS 89

8	4,527,457
41.01	4,527,458
161	4,527,459

CLASS 91

491	4,527,460
519	4,527,461

CLASS 92

51	4,527,462
84	4,527,463
86.5	4,527,464
136	4,527,465

CLASS 98

2.13	4,527,466

CLASS 99

279	4,527,467

CLASS 101

2	4,527,468
93.04	4,527,469
111	4,527,470
148	4,527,471
219	4,527,472
220	4,527,473
247	4,527,474
316	4,527,475
352	4,527,476
365	4,527,477
415.1	4,527,478
450.1	4,527,479

CLASS 102

202.1	4,527,480
204	4,527,481
331	4,527,482
521	4,527,483

CLASS 104

89	4,527,484
118	4,527,485

CLASS 105

215 C	4,527,486
223	4,527,487
247	4,527,488
358	4,527,489

CLASS 106

30	4,528,036
81	4,528,037
287.13	4,528,038

CLASS 108

111	4,527,490

CLASS 112

104	4,527,491
121.12	4,527,492
121.27	4,527,493
231	4,527,494
264.1	4,527,495
279	4,527,496
313	4,527,497
323	4,527,498

CLASS 114

39	4,527,499
229	4,527,500
230	4,527,501
319	4,527,502
365	4,527,503

CLASS 116

211	4,527,504

CLASS 118

44	4,527,505
63	4,527,506
314	4,527,507
425	4,527,508
669	4,527,510

CLASS 119

1	4,527,511
19	4,527,512
51.5	4,527,513
53.5	Re.31,939
156	Re.31,940

CLASS 122

31 R	4,527,514
392	4,527,515

CLASS 123

27 GE	4,527,516
41.47	4,527,517
90.23	4,527,518
188 M	4,527,519
196 R	4,527,520
326	4,527,521
416	4,527,522
419	4,527,523
425	4,527,524
	4,527,525
	4,527,526
438	4,527,527
447	4,527,528
478	4,527,529
494	4,527,530
501	4,527,531
520	4,527,532
557	4,527,533
559	4,527,534
617	4,527,535

CLASS 124

35 A	4,527,536

CLASS 125

11 TP	4,527,537

CLASS 126

21 R	4,527,538
39 R	4,527,539
42	4,527,540
123	4,527,541
299 D	4,527,542
361	4,527,543
419	4,527,544
433	4,527,545
440	4,527,546
444	4,527,547
448	4,527,548

CLASS 128

1 D	4,527,549
1.5	4,527,550
4	4,527,551
6	4,527,552
11	4,527,553
69	4,527,555
80 H	4,527,556
92 B	4,527,554
204.23	4,527,557
205.24	4,527,558
207.17	4,527,559
303.1	4,527,560
303.13	B1 4,166,465
314	4,527,561
325	4,527,562
329 R	4,527,563
339	4,527,564
402	4,527,565
	4,527,566
419 PG	4,527,568
419 PT	4,527,567
660	4,527,569

CLASS 131

94	4,527,570
329	4,527,571
336	4,527,572
	4,527,573

CLASS 132

84 B	4,527,574
88.7	4,527,575
123	4,527,576

CLASS 133

3 H	4,527,577

CLASS 134

2	4,528,039
8	4,528,040
	4,528,041
57 R	4,527,578

CLASS 135

74	4,527,579

CLASS 136

253	4,528,417
256	4,528,418

CLASS 137

1	4,527,580
13	4,527,581
81.2	4,527,582
82	4,527,583
192	4,527,584
240	4,527,585
318	4,527,586
329.3	4,527,587
565	4,527,588
596	4,527,589
596.17	4,527,590
625.21	4,527,591
625.61	4,527,592
805	4,527,593
854	4,527,594

CLASS 138

43	4,527,595

CLASS 139

1 C	4,527,596
68	4,527,597
435	4,527,598

CLASS 140

119	4,527,599

CLASS 141

4	4,527,600
348	4,527,601

CLASS 142

55	4,527,602

CLASS 144

2 Z	4,527,603
176	4,527,604
286 R	4,527,605

CLASS 148

11.5 A	4,528,042
12 E	4,528,046
13.1	4,528,043
18	4,528,044
35	4,528,045
175	4,528,047
404	4,528,048

CLASS 149

21	4,528,049

CLASS 152

209 R	4,527,606

CLASS 156

62.4	4,528,050
92	4,528,051
117	4,528,052
204	4,528,053
226	4,528,054
247	4,528,055
253	4,528,056
273.7	4,528,057
306.6	4,528,058
307.3	4,528,059
432	4,528,060
605	4,528,061
611	4,528,062
626	4,528,063
630	4,528,064
643	4,528,065
	4,528,066

CLASS 157

1.3 4,527,607

CLASS 162

281 4,528,067

CLASS 164

58.1 4,527,608
253 4,527,609
287 4,527,610
329 4,527,611
428 4,527,612
463 4,527,613
4,527,614
468 4,527,615
502 4,527,616

CLASS 165

9.4 4,527,617
18 4,527,618
41 4,527,619
80 D 4,527,620
104.12 4,527,621
166 4,527,622
173 4,527,623
184 4,527,624

CLASS 166

187 4,527,625
275 4,527,626
280 4,527,627
295 4,527,628
297 B1 3,706,344
321 4,527,629
4,527,630
322 4,527,631
357 4,527,632
370 4,527,633

CLASS 169

13 4,527,634
26 4,527,635

CLASS 174

88 R 4,528,419
112 4,528,420
143 4,528,421

CLASS 175

4.55 4,527,636
55 4,527,637
57 4,527,638
61 4,527,639
86 4,527,640
92 4,527,641
329 4,527,642
4,527,643
333 4,527,644

CLASS 177

1 4,527,645
25 4,527,646
105 4,527,647

CLASS 179

2 A 4,528,422
5 R 4,528,423
17 A 4,528,424
18 HB 4,528,425
121 D 4,528,426
175.3 F 4,528,427

CLASS 180

6.48 4,527,649
6.5 4,527,648
8.6 4,527,650
19.2 4,527,651
19.3 4,527,652
79.1 4,527,653
140 4,527,654
246 4,527,655
321 4,527,656

CLASS 181

18 4,527,657
235 4,527,658
244 4,527,659

CLASS 182

9 4,527,660

CLASS 184

6.1 4,527,661

CLASS 187

29 R 4,527,662
4,527,663

CLASS 188

1.11 4,527,664
20 4,527,665
33 4,527,666
73.34 4,527,667
73.38 4,527,668
4,527,669
73.44 4,527,670
82.74 4,527,671
264 G 4,527,672
269 4,527,673
284 4,527,674
290 4,527,675
299 4,527,676

CLASS 190

110 4,527,677

CLASS 192

3.58 4,527,678
4,527,679
4 R 4,527,680
52 4,527,681
99 S 4,527,682
111 A 4,527,683
130 4,527,684

CLASS 196

14.52 4,528,068

CLASS 198

339 4,527,685
807 4,527,686

CLASS 200

5 A 4,528,428
50 B 4,528,429
61.62 4,528,430
67 A 4,528,431
144 B 4,528,432
150 C 4,528,433

CLASS 201

20 4,528,069

CLASS 204

11 4,528,070
4,528,071
15 4,528,072
4,528,073
16 4,528,074
55 R 4,528,075
78 4,528,076
95 4,528,077
129 4,528,078
129.1 4,528,079
157.1 R 4,528,080
159.13 4,528,081
192 S 4,528,082
265 4,528,083
290 F 4,528,084
416 4,528,085
427 4,528,086

CLASS 206

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315.1 4,527,688
342 4,527,689
387 4,527,690
4,527,691
444 4,527,692
554 4,527,693

CLASS 208

22 4,528,087
96 4,528,088
216 R 4,528,089

CLASS 209

2 4,528,090
139 R 4,528,091
4,528,092

CLASS 210

96.2 4,528,093
114 4,528,094
206 4,528,095
222 4,528,096
353 4,528,097
414 4,528,098
489 4,528,099
634 4,528,100
656 4,528,101
705 4,528,102
791 4,528,103

CLASS 211

46 4,527,694
71 4,527,695
86 4,527,696
189 4,527,697

CLASS 212

187 4,527,698

CLASS 215

1 C 4,527,699
32 4,527,700
220 4,527,701
225 4,527,702
232 4,527,703
252 4,527,704
4,527,705
4,527,706

CLASS 219

10.49 A 4,528,434
69 M 4,528,435
74 4,528,436
85 CA 4,528,437
121 PE 4,528,438
370 4,528,440
386 4,528,439
532 4,528,441

CLASS 220

1 R 4,527,707
18 4,527,708
22 4,527,709
378 4,527,710

CLASS 221

244 4,527,711

CLASS 222

1 4,527,712
2 4,527,713
56 4,527,714
61 4,527,715
83.5 4,527,716
103 B1 3,741,439
593 4,527,717
603 4,527,718

CLASS 223

44 4,527,719

CLASS 224

148 4,527,720
151 4,527,721

CLASS 225

106 4,527,722

CLASS 226

172 4,527,723

CLASS 227

8 4,527,724
19 4,527,725
4,527,726

CLASS 228

1.1 4,527,727
119 4,527,728
162 4,527,729
179 4,527,730
180.2 4,527,731

CLASS 229

17 G 4,527,732

CLASS 235

379 4,528,442
462 4,528,443
4,528,444
469 4,528,445

CLASS 236

41 4,527,733
49 4,527,734
87 4,527,735

CLASS 238

283 4,527,736

CLASS 239

89 4,527,737
90 4,527,738
186 4,527,739
318 4,527,740
333 4,527,741
391 4,527,742
530 4,527,743
585 4,527,744
600 4,527,745

CLASS 241

23 4,527,746
26 4,527,747
57 4,527,748

CLASS 242

7.15 4,527,749
56 R 4,527,750
68.3 4,527,756
75.51 4,527,751
84.2 G 4,527,752
84.51 R 4,527,753
118.1 4,527,754
199 4,527,755

CLASS 244

20 4,527,757
150 4,527,758

CLASS 248

73 4,527,759
108 4,527,760
128 4,527,761
222.1 4,527,762
238 4,527,763
309.1 4,527,764
346 4,527,765
371 4,527,766
419 4,527,767

CLASS 249

214 4,527,768

CLASS 250

213 VT 4,528,447
216 4,528,446
231 SE 4,528,448
352 4,528,449
362 4,528,450
441.1 4,528,451
491.1 4,528,452
505.1 4,528,453
506.1 4,528,454
563 4,528,455

CLASS 251

14 4,527,769
26 4,527,770
118 4,527,771
138 4,527,772
306 4,527,773
337 4,527,774

CLASS 252

8.5 M 4,528,104
8.55 D 4,528,105
4,528,106
61 4,528,107
75 4,528,108
78.1 4,528,109
106 4,528,110
107 4,528,111
182 4,528,112
299.1 4,528,113
299.6 4,528,114
299.63 4,528,115
4,528,116
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503 4,528,119
511 4,528,123
516 4,528,120
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518 4,528,122
522 A 4,528,125
522 R 4,528,124
4,528,126
549 4,528,128
628 4,528,129
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CLASS 254

134.3 FT 4,527,775

CLASS 260

112 R 4,528,131
112.5 R 4,528,133
112.5 T 4,528,132
112.7 4,528,134
245.2 R 4,528,135
391 4,528,136
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397.45 4,528,138
402.5 4,528,140
403 4,528,139
455 B 4,528,141
463 4,528,142
465 G 4,528,143
503 4,528,144
543 F 4,528,145
544 D 4,528,146

CLASS 261

128 4,528,147

CLASS 264

1.5 4,528,148
13 4,528,149
36 4,528,150
83 4,528,151
87 4,528,152
109 4,528,153
4,528,154
174 4,528,155
236 4,528,156
237 4,528,157

CLASS 266

44 4,527,776
50 4,527,777
171 4,527,778
227 4,527,779

CLASS 267

64.12 4,527,780
64.24 4,527,781
177 4,527,782

CLASS 269

21 4,527,783
42 4,527,784
71 4,527,785
154 4,527,786
322 4,527,787

CLASS 270

21.1 4,527,788
31 4,527,789
58 4,527,790
4,527,791

CLASS 271

225 4,527,792
263 4,527,793

CLASS 272

70 4,527,794
71 4,527,795
77 4,527,796
123 4,527,797

CLASS 273

86 R 4,527,798
164 4,527,799
261 4,527,800
323 4,527,801

CLASS 277

1 4,527,802
4,527,803
4,527,804
80 4,527,805
124 4,527,806
189 4,527,807

CLASS 279

1 J 4,527,808
64 4,527,809

CLASS 280

43.23 4,527,810
281 LP 4,527,811
402 4,527,812
654 4,527,813

CLASS 281

31 4,527,814

CLASS 285

55 4,527,815
81 4,527,816
96 4,527,817
174 4,527,818
287 4,527,819
382.2 4,527,820

CLASS 292

19 4,527,821
257 4,527,822

CLASS 294

16 4,527,823
64.1 4,527,824

CLASS 296

1 C 4,527,825
3 4,527,826
4,527,827
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CLASS 297

17 4,527,829
192 4,527,830
243 4,527,831
355 4,527,832
397 4,527,833
410 4,527,834
482 4,527,835

CLASS 299

17 4,527,836
31 4,527,837

CLASS 300

7 4,527,838

CLASS 301

63 DD 4,527,839

CLASS 307

31 4,528,456
46 4,528,457
64 4,528,458
66 4,528,459
95 4,528,460
252 L 4,528,461
4,528,462
270 4,528,463
425 4,528,464
454 4,528,465

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6 C 4,527,840
4,527,841
4,527,842

CLASS 310

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12 4,528,466
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21 4,528,468
59 4,528,469
78 4,528,470
198 4,528,472
256 4,528,473

CLASS 312

31.2 4,527,843
214 4,527,844
215 4,527,845

CLASS 313

346 R 4,528,474
405 4,528,475
412 4,528,476
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631 4,528,478

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248 4,528,481
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382 4,528,488
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CLASS 323

237 4,528,494
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59 4,528,498
62 4,528,499
73 PC 4,528,500
103 P 4,528,501
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158 D 4,528,503
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225 4,528,506
229 4,528,507
303 4,528,508
309 4,528,509
4,528,510

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4,528,512
145 4,528,513

CLASS 330

146 4,528,514
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7.51 4,528,525
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19 4,528,527

CLASS 333

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195 4,528,546

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97 P 4,527,852
97 R 4,527,853
98 4,527,854
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258 S 4,527,857

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347 DD 4,528,550
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526 4,528,553
573 4,528,554
630 4,528,555
648 4,528,556
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690 4,528,559
709 4,528,560
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805 4,528,562
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3 DR 4,527,883
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100 4,527,890

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43 4,527,896
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446 4,527,898

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71 4,528,583

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160 4,528,591
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314 4,528,598
328 4,528,599

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14.1 4,528,600
46 4,528,601
66 4,528,602
70 4,528,603
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77 4,528,605
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150 4,527,967
173 4,527,968
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249 4,528,163

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4,528,220
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55 4,528,271
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CLASS 440

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CLASS 441

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612 4,528,695

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183 4,527,978

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9 4,528,275

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	4,528,364	66	4,528,373		4,528,384	067	4,528,395	659	4,528,406	349	4,527,988
392	4,528,365	186	4,528,374	307	4,528,385	256	4,528,396	804	4,528,407	385 A	4,527,989
422	4,528,366	193	4,528,375	335	4,528,386		CLASS 562	808	4,528,408	399	4,527,990
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	291	279,517		334	279,535		72	279,553		199	279,571	D21—	52	279,588		59	279,605
		279,518		335	279,536		103	279,554			279,572		78	279,589	D25—	67	279,606
	313	279,519		337	279,537	D11—	4	279,555	D16—	1	279,573		122	279,590		69	279,607
	382	279,520		357	279,538		133	279,556		5	279,574		132	279,591		77	279,608
D3—	30.1	279,521		359	279,539		157	279,557		128	279,575		136	279,592		80	279,609
	34	279,522	D8—	11	279,540			279,558	D17—	22	279,576			279,593		88	279,610
	40	279,523			279,541			279,559	D18—	3	279,577		202	279,594	D26—	65	279,611
	61	279,524			279,542	D12—	185	279,560			279,578		238	279,595		138	279,612
	71	279,525		30	279,543		317	279,561		4	279,579	D23—	28	279,596	D28—	48	279,613
D4—	104	279,526		45	279,544	D14—	52	279,562		7	279,580			279,597	D32—	21	279,614
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	545	279,530		372	279,547		102	279,566	D20—	8	279,584		112	279,601		44	279,618
	601	279,531		376	279,549	D15—	29	279,567		10	279,585	D24—	8	279,602	D99—	29	279,619
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4,527,511	4,527,771	4,528,607	4,528,389	4,527,635	4,528,369
4,528,639	4,527,772	4,528,609	11 : 4,527,354	4,527,659	4,528,373
04 : 4,527,289	4,527,794	4,528,620	4,527,927	4,527,673	4,528,433
4,527,330	4,527,800	4,528,648	4,527,950	4,527,677	3,883,334
4,527,342	4,527,830	4,528,649	12 : 4,527,293	4,527,694	19 : Re.31,939
4,527,579	4,527,833	4,528,652	4,527,316	4,527,738	4,527,578
4,527,799	4,527,872	4,528,669	4,527,338	4,527,743	4,528,459
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4,528,526	4,527,980	3,741,439	4,527,410	4,527,849	21 : 4,527,486
4,528,545	4,527,996	4,428,200	4,527,546	4,528,056	4,527,570
4,528,548	4,528,023	08 : Re.31,940	4,527,594	4,528,101	4,527,776
4,528,624	4,528,027	4,527,362	4,527,648	4,528,132	4,528,431
4,528,636	4,528,028	4,527,374	4,527,657	4,528,204	22 : 4,527,604
05 : 4,527,713	4,528,063	4,527,482	4,527,658	4,528,217	4,527,928
4,527,714	4,528,078	4,527,810	4,527,681	4,528,237	4,528,176
4,527,941	4,528,089	4,527,837	4,527,741	4,528,255	4,528,364
06 : Re.31,941	4,528,129	4,528,521	4,527,768	4,528,295	23 : 4,527,368
Re.31,943	4,528,159	4,166,465	4,527,827	4,528,361	24 : 4,527,389
4,527,288	4,528,161	09 : 4,527,303	4,527,939	4,528,412	4,527,417
4,527,295	4,528,169	4,527,361	4,527,988	4,528,430	4,527,480
4,527,298	4,528,190	4,527,376	4,528,005	4,528,450	4,527,797
4,527,350	4,528,233	4,527,386	4,528,274	4,528,455	4,527,982
4,527,353	4,528,247	4,527,391	4,528,461	4,528,493	4,528,011
4,527,405	4,528,248	4,527,468	4,528,462	4,528,534	4,528,154
4,527,407	4,528,249	4,527,575	4,528,504	4,528,614	4,528,230
4,527,419	4,528,250	4,527,609	4,528,528	4,528,616	4,528,273
4,527,429	4,528,253	4,527,662	4,528,626	4,528,621	4,528,630
4,527,437	4,528,267	4,527,749	4,528,674	4,528,635	4,528,660
4,527,450	4,528,276	4,527,790	13 : 4,527,566	4,528,663	25 : 4,527,310
4,527,456	4,528,277	4,527,791	4,527,764	4,528,691	4,527,315
4,527,469	4,528,311	4,527,819	4,527,948	18 : 4,527,321	4,527,387
4,527,470	4,528,448	4,527,900	4,528,021	4,527,390	4,527,408
4,527,503	4,528,452	4,527,901	4,528,199	4,527,413	4,527,449
4,527,541	4,528,457	4,527,911	4,528,437	4,527,489	4,527,583
4,527,553	4,528,463	4,528,015	15 : 4,527,499	4,527,513	4,527,620
4,527,557	4,528,465	4,528,017	16 : 4,527,959	4,527,542	4,527,638
4,527,563	4,528,467	4,528,022	17 : 4,527,312	4,527,656	4,527,697
4,527,588	4,528,474	4,528,048	4,527,323	4,527,672	4,527,733
4,527,619	4,528,484	4,528,081	4,527,328	4,527,684	4,527,888
4,527,623	4,528,490	4,528,103	4,527,358	4,527,722	4,527,931
4,527,637	4,528,501	4,528,106	4,527,363	4,527,811	4,527,999
4,527,639	4,528,503	4,528,320	4,527,366	4,527,846	4,528,083
4,527,650	4,528,514	4,528,381	4,527,438	4,527,860	4,528,093
4,527,685	4,528,529	4,528,387	4,527,444	4,527,861	4,528,173
4,527,688	4,528,546	4,528,424	4,527,472	4,527,912	4,528,197
4,527,692	4,528,559	4,528,551	4,527,475	4,527,986	4,528,208
4,527,701	4,528,567	4,528,622	4,527,504	4,528,069	4,528,449
4,527,707	4,528,574	4,528,628	4,527,510	4,528,079	4,528,451
4,527,716	4,528,581	4,528,644	4,527,514	4,528,164	4,528,478
4,527,728	4,528,589	4,528,668	4,527,580	4,528,177	4,528,479
4,527,740	4,528,594	10 : 4,527,953	4,527,590	4,528,290	4,528,533

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26 : Re.31,942
4,527,314
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DESIGN PATENTS

04 :	279,559	08 :	279,561		279,588		279,601		279,583	42 :	279,517
06 :	279,521		279,565		279,602	29 :	279,519		279,606		279,518
	279,522	09 :	279,553	18 :	279,607		279,590		279,611		279,554
	279,524		279,574	21 :	279,525		279,619		279,616		279,581
	279,528		279,612		279,548	34 :	279,523	39 :	279,539	43 :	279,540
	279,530		279,618		279,585		279,538		279,570		279,541
	279,533	12 :	279,556		279,587		279,569		279,584		279,542
	279,550		279,557	22 :	279,617		279,589		279,614	46 :	279,560
	279,564		279,558	27 :	279,527	36 :	279,516		279,615	48 :	279,536
	279,575		279,562		279,535		279,529	40 :	279,549		279,582
	279,593		279,594		279,537		279,531	41 :	279,515	51 :	279,551
	279,605	13 :	279,520		279,586		279,534		279,544	55 :	279,603
	279,608	17 :	279,566		279,595		279,546		279,576		

PLANT PATENTS

23 :	5,508						

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